MARCH, 1957

Commercial Fertilizer

and PLANT FOOD INDUSTRY

# DOES HE BUY ALL HIS FERTILIZER FROM YOU?

SEE PAGE 19

(Advertisement)

# Take a good look at your multiwall bag!

Like women's bathing suits, multiwall bags also reveal the passing of time.

Is your bag a vivid, modern example of your business vitality . . . or is it dull, drab and lacking in appeal?

Is your bag the ideal package for your product, in size and construction, or is it a carry-over from the past?

To compete successfully in your markets, your package should be as up-to-date as this issue of the magazine . . . *if it isn't*, it's a good idea to send for us.

**KRAFT BAG CORPORATION**

*Gilman Paper Company Subsidiary*

**630 Fifth Avenue, New York 20, N. Y.**
**Daily News Bldg., Chicago 6, Ill.**

*Plants at St. Marys, Georgia and Gilman, Vermont*
Sales Agents for The Kraftpacker

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gaylord Container Div.
• The Gilman Corp.
• Kraft Bag Corp.

*Dependable as a service for 3 generations*

The Newest
**KRAFTPACKER**
will handle practically any free-flowing material—faster—and with more accuracy, than any open mouth bag filling machine of its type in use today—regardless of price!

☐ We are interested in improving our bag.

☐ We are interested in your Kraftpacker.

NAME OF COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____ PRINCIPAL_____

PRODUCT MFD._____ CP

# Make Nutronite

formerly SMIROW

## the new sales builder in your fertilizer

## NUTRONITE is the quality, natural organic supplement to chemical plant foods.

★ **Valuable to your customers**
because it provides for *controlled release* of plant nutrients for health, steady growth and good color.

★ **Valuable to your dealers**
because it is plainly visible in fertilizer—they can point to it in selling *your* brand.

★ **Valuable to your employees**
because it's less dusty—also no hazard in handling.

★ **Valuable to you**
for all these reasons plus giving you a new sales stimulant in a time of tough competition.

***Let us figure the cost of NUTRONITE delivered to your plant.***

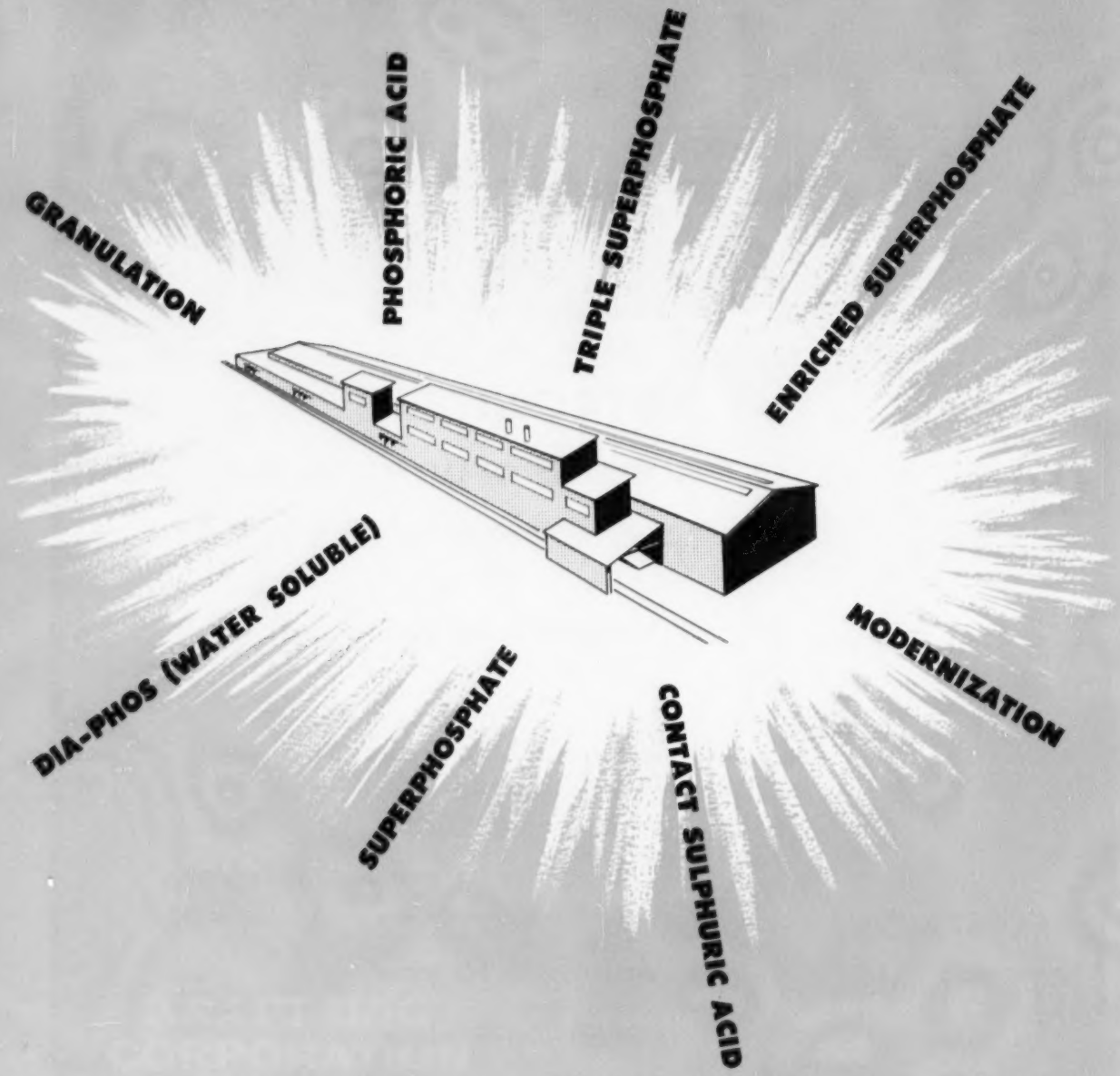
SMITH NUTRONITE ROWLAND

**SMITH-ROWLAND CO.**
P. O. Box 1219, Norfolk 1, Va.
A DIVISION OF SMITH DOUGLASS COMPANY, INCORPORATED

**SELL NUTRONITE FOR LAWNS**

Bag straight Nutronite to fill out your line of lawn and garden fertilizers. Golf courses use large quantities, too. Colorful Nutronite bags available, plus merchandising aids. For information, write Smith-Rowland Co., Norfolk, Va.

# WHAT FACILITIES DO YOU NEED?




***TALK IT OVER WITH US!***

## The D. M. WEATHERLY COMPANY

*Industrial Engineers and Builders*

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# Commercial Fertilizer
## and PLANT FOOD INDUSTRY

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## Commenting Freely

*by* Bruce Moran

**People who write Government releases should give a little more thought than they do to what a hasty newspaper man is likely to make of them. The recent release concerning the 1954 Census of Agriculture is a case in point. We have here in the office clippings showing such headlines as this: "Cost of Fertilizer to Farmers Triples Since War." And that, surely, is a misleading headline.**

**Farmers are using 35 times as much fertilizer as they did 75 years ago—and there's no doubt it is costing more per ton . . . even costing more per unit of plant food. But when you analyze how much plant food a farmer gets in today's high analysis fertilizer for each of today's dollars, our industry can be mighty proud of its achievement in keeping the price down.**

**It is interesting to know farmers used 19 million tons in '54. But why should the vital statistic be omitted? How many units of plant food were there in each of those tons? That's the real story. —and it is an achievement in education.**

# *Now – for direct application . . .*

## highest quality. . . granulated triple super

*Just one trip across the field with this dustless, easy-to-handle, granulated 0-45-0 will make a repeat customer out of a trial user. Cash in now on spring sales.*

## *Builds customer satisfaction and repeat sales*

You'll like the compliments you'll get after your customers have tried your new 0-45-0 from International for the first time.

Look at typical comments from users of this high-quality triple:

"It sure goes on easy." (You bet it does! It's granulated for easy going through any fertilizing rig.)

"Pleasure to use." (Yes . . . and just one downwind trip across the field will prove it to anyone . . . will build more repeat sales than a dozen sales talks.)

"Saves time and money." (Now your customers can avoid breaking up lumps in the bag or stopping in the middle of a field to kick a clogged-up rig. Easy to handle . . . just fill the fertilizer hopper and push off. Easy to put on.)

What's more, agronomists can tell you the high availability of this superior product delivers results that build farmer satisfaction and repeat sales. The reason: special processing and manufacturing care produces a triple that resists reversion in the soil . . . supplies growing plants the phosphorus they need when they need it.

Call or write International today for samples and complete details.

# free-flowing...top-performing that sells itself on sight

## *bagged under your own label... shipped direct to your dealers**

Here's a new triple super you'll be proud to add to your own line of fertilizers . . . the new, granulated 0-45-0 from International Minerals and Chemical.

This superior triple can be shipped in bulk, or International will be happy to have it bagged in adequate quantities under your own label . . . ship direct to your own dealers, too, if you like.

Here's what this can mean to you:

- A top-quality triple super that carries your own private label and complements the rest of your line.
- A modern, easy-to-use, top-performing triple super that will bring you increased customer satisfaction and plenty of repeat sales.

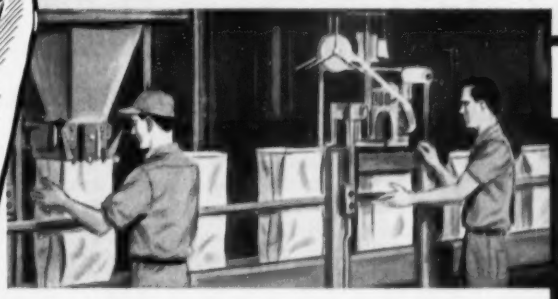
The unbeatable convenience of distributing this high-quality product under your own brand name direct to your dealers without touching a single bag.

What's more, you'll find that dealing with International is a pleasure. You'll appreciate the friendly cooperation from International's transportation department . . . the fast service . . . and the reliability of supply.

See your International triple-super sales representative soon for complete details on minimum order requirements, price and delivery information. He'll be glad to show you samples. And one look at this new 0-45-0 will show you why you can't get a better deal than this new triple super now available for direct application sales.

**subject to minimum order requirements*

Profit now from this superior 0-45-0. Bagged under your own brand name.



*Superior texture of this new triple super, put up in your own bags, stores without caking. It's granulated for easy going through any fertilizer attachment.*

MINERALS International CHEMICALS

PHOSPHATE CHEMICALS DIVISION

**INTERNATIONAL MINERALS & CHEMICAL CORPORATION**

*General Offices: 20 North Wacker Drive, Chicago 6*

# JUST AROUND THE CORNER *by Vernon Mount*

NOT CONGRESS, but business may be the President's major problem over the next couple of years. The feeling grows that he is out-spending Roosevelt, and going too far with the welfare state. Organized opposition is getting under way with National Association of Manufacturers and the National Chamber of Commerce both working toward concerted national resistance to more spending.

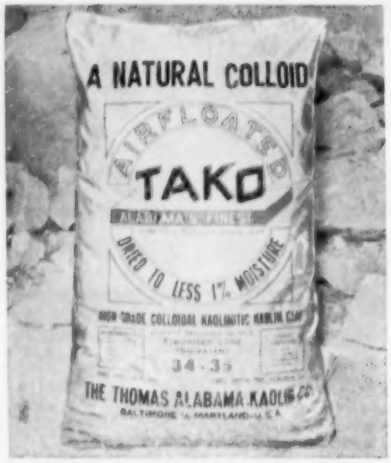
ON THE OTHER HAND there seems to be much feeling among the smaller fry that "entrenched capitalism" is keeping our defense budgets high, for the good of those who make the war materiel.

BOTH ARE FAMILIAR attitudes, and we have seen them come and go in the past. Perhaps that's typical America. And the fact that he is being sniped at from both sides may indicate that Ike is really in the middle of the road, where he'd prefer to be.

Yours faithfully,

*Vernon Mount*


**UNIFORM QUALITY - USE WITH CONFIDENCE -**




QUALITY & SERVICE SINCE 1939

**"TAKO"** Natural High Grade Pure Colloidal Kaolinitic Kaolin Crude from our very extensive deposits is processed by neither adding to nor taking away any of its very desirable properties. Its colloidal properties give increased workability in formulations and its purity is highly desirable due to its compatibility with chemicals.

**"TAKO"** Airfloated Colloidal Kaolinitic Kaolin is a natural exclusive product—a practically pure inert colloid with exceptional qualities—contains absolutely no mica—practically chemically pure.

**"TAKO"** Excellent adhesive-absorption qualities—excels in formulations of insecticides-pesticides—inert colloidal properties increase toxic action—give increased workability—dispersion—free flowing from all types of dusting equipment—absolute minimum drifting.

NO MICA
NO ALKALIES

**MICRON SIZE**

| | | |
|---|---|---|
| MINUS 1 MICRON | | 55% |
| " 2 " | | 68% |
| " 5 " | | 85% |

GUARANTEED LESS 1% FREE MOISTURE

AIRFLOATED — BAGGED OR BULK

**DEPENDABLE PROMPT SERVICE**

*Non-abrasive • Non-hygroscopic • Non-caking • Free-flowing*

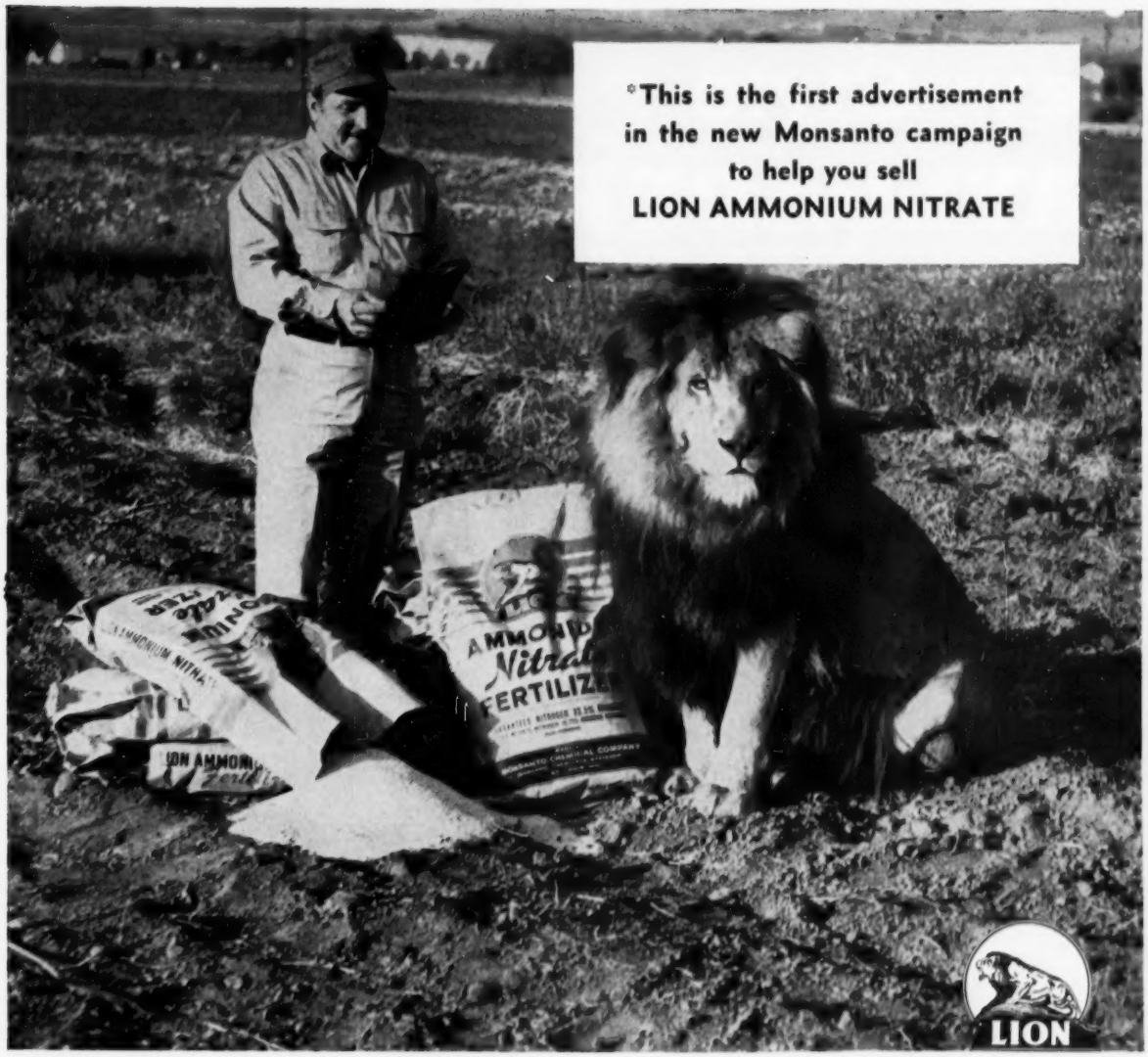
**"TAKO"** is produced under complete laboratory control. Large tonnage used by the insecticide-pesticide, fertilizer, chemical, & other large industries.

**THE THOMAS ALABAMA KAOLIN COMPANY**

2412 KEN OAK ROAD — BALTIMORE 9, MARYLAND

**Plants & Shipping Point — Hackleburg, Alabama**

*INVESTIGATE "TAKO" FOR YOUR REQUIREMENTS*




# You save money with LION in your fields

## LION BRAND AMMONIUM NITRATE IS A LOW-COST SOLID NITROGEN FERTILIZER

**FOR LOW-COST NITROGEN,** LION is the brand. Lion Ammonium Nitrate is guaranteed to contain 33.5% nitrogen, which means lower-cost nitrogen for your crops . . . more for your money in bigger crop yields.

**FOR MORE PRODUCTION,** Lion Ammonium Nitrate contains TWO kinds of plant nitrogen. *Quick-acting* nitrate nitrogen that gets crops started fast . . . and *long-lasting* ammonia nitrogen that resists leaching and feeds your crops steadily during the important growing months that follow.

**FOR EASIER SPREADING,** Lion Ammonium Nitrate is in pellet form. These pellets are specially coated to withstand caking . . . then packed in specially lined, moisture-resistant bags. Here's double assurance Lion brand will flow freely, spread evenly after shipment or storage.

**MADE BY WORLD'S LARGEST.** Lion Brand Ammonium Nitrate is made by Monsanto Chemical Company, world's largest producer of prilled ammonium nitrate—and *your* most reliable source of *low-cost* nitrogen. Save money. Buy *Lion!*

**DISTRICT SALES OFFICES:** Lion Oil Building, El Dorado, Ark.; 1220 National Bank of Commerce Building, New Orleans 12, La.; 1401 Peachtree St., Atlanta 9, Ga.

**GROW MORE PROFITABLY** . . . Weed Killers Brush Killers • DDT and Parathion Insecticides • Medo-Green® Silage Preservative • Phosphates (Liquid and Solid)

MONSANTO

MONSANTO CHEMICAL COMPANY • ST. LOUIS 1, MISSOURI

# New-Style PAYLOADER® DOUBLES PRODUCTION

## WITHOUT INCREASING LABOR COSTS

How to keep up with production demand yet hold down production costs in the face of more competitive markets, tighter labor supplies and rising labor costs? . . . One proven solution is to increase output per man by providing your operators with the most modern, most productive machines available. In the field of bulk or loose materials handling, the answer is "PAYLOADER" tractor-shovels. They are built by the pioneer and leader in the tractor-shovel industry and there are *more* "PAYLOADER" units in use than all other makes combined. Industrial plants that have been "PAYLOADER" users for years tell us that it has paid them well to replace older units with the new, more productive "PAYLOADER" models . . . that they not only handle more tonnage than earlier models, but are also way ahead of other tractor-shovels in design and in the features that make them MORE PRODUCTIVE. There is a size and type to meet every need.

# • MORE TONS per man hour

**DIGS MORE**

The new-model HA "PAYLOADER" is especially designed for fast, low-cost materials handling — indoors and outdoors. Rear-wheel-steer and compact design makes it easy to maneuver in close quarters. The distinctive bucket action with powerful, 40° break-out and tip-back at ground level digs heaping loads quickly.

**CARRIES MORE**

Heaped loads are cradled close and low for greater stability while carrying. Hydraulic system load-shock-absorber cushions the load, smooths the ride and permits faster movement with less spillage and greater safety. Torque converter drive makes for smooth, fast starts, quick maneuvering and easier control.

**DELIVERS MORE**

It's the tonnage delivered per hour that counts. Since you get MORE load to begin with, and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result is you *deliver* more tons per load and more loads per man-hour, hour after hour and day after day.

## Better Engineered for Better Performance

**Shortest Turning Radius** — The model HA can work where others can't because it has a shorter turning radius than any comparable tractor-shovel — goes through doorways and spaces less than 4½ feet wide — easily turns corners of 6 foot aisles.

**Higher Dumping Height** — The model HA can deliver its loads over bin and hopper edges up to 6½ feet high. Loads can be dumped as fast or slow as desired at any height.

**Biggest Capacity** — With a bucket capacity of 18 cubic feet payload, and 14 cubic feet struck, the model HA has a carrying capacity up to 25 percent greater than comparative machines—and more than some bigger, heavier machines.

**Easiest Operating** — The entire hydraulic control of the model HA bucket — tip-back, raise, dump and lower — is handled by a single conveniently located lever. It's the simplest, easiest bucket control available.

***WANT PROOF? If you are using a "PAYLOADER" that is more than 2 years old, ask your "PAYLOADER" distributor for a demonstration of the latest model, and see how much more work your operator can turn out—and how much more than with any other comparable size machine. Call him today.***

**PAYLOADER®**
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

**THE FRANK G. HOUGH CO.**
702 Sunnyside Ave., Libertyville, Ill.

Send full data on "PAYLOADER" tractor-shovels as follows:

☐ Front-wheel-drive models HA (18 cu. ft.) and HAH (1 cu. yd.)

☐ Larger models (including 4-wheel drives up to 2¼ cu. yd.)

Name _____

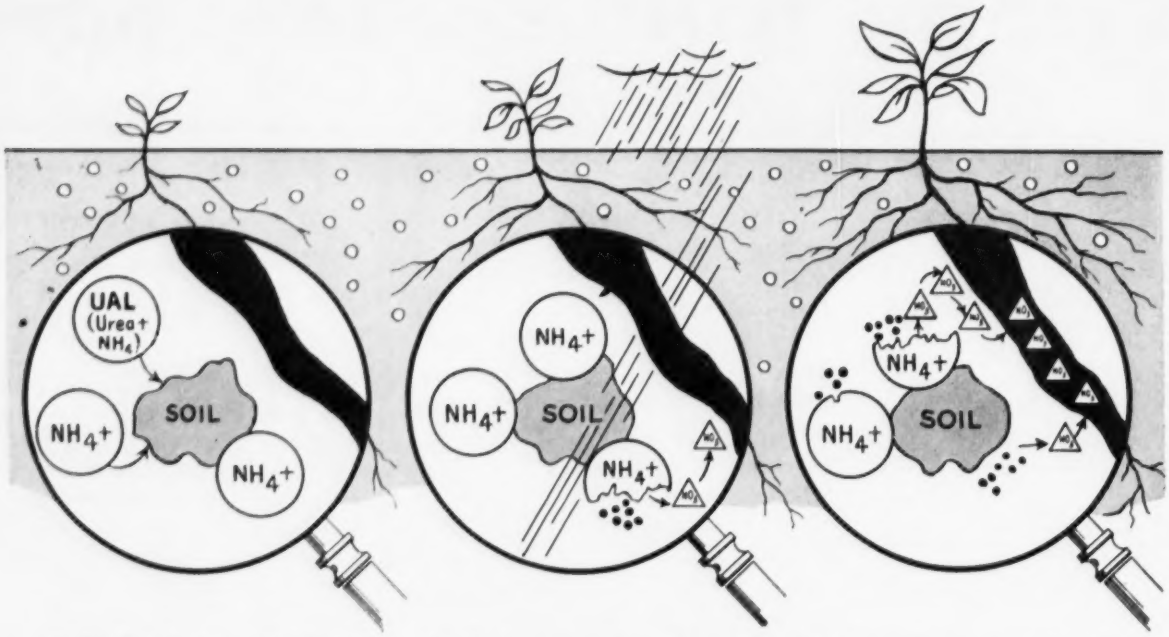
Title _____

Company _____

Street _____

City _____ State _____

43




**1.** Du Pont UAL provides fertilizer mixtures with urea and ammonium nitrogen. In the soil, urea quickly converts to ammonium nitrogen, which attaches to the soil particles.

**2.** This ammonium nitrogen resists leaching. Nitrogen is made available to the plants when soil bacteria convert the ammonium nitrogen to nitrate nitrogen.

**3.** Under normal growing conditions, the conversion of ammonium nitrogen to nitrate nitrogen occurs at about the same rate that growing plants demand this nutrient nitrogen.

# How nitrogen from Du Pont URAMON® Ammonia Liquors resists leaching . . . nourishes crops to maturity

Fertilizers ammoniated with Du Pont UAL have extra sales appeal because they are composed of two highly efficient forms of nitrogen. These forms—urea and ammonium—supply nitrogen that nourishes plants at the rate required for maximum growth and yields.

Nitrogen from Du Pont UAL resists leaching—remains in the root zone where plants readily absorb it. Thus, on the basis of units of nitrogen actually available to plants, UAL is a very economical investment.

Four formulations are available, including UAL 37—a special composition that releases nitrogen even more slowly. For technical assistance and information on the solution best suited to your use, write Du Pont.

**Here are other important advantages of Du Pont URAMON® Ammonia Liquors:**

- Safe in granulation . . . no danger of flash fires and less stack. Gives firm, uniform, stable granules, best for storage and application.
- Won't corrode regular fertilizer manufacturing equipment, including ordinary steel and aluminum.
- Gives mixed goods better "feel"—minimizes caking, segregation and dusting.
- Suitable for either batch or continuous mixing.
- Prompt, dependable delivery enables you to schedule your production with confidence.

DU PONT
REG. U.S. PAT. OFF.

**URAMON®**
**AMMONIA LIQUORS**

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

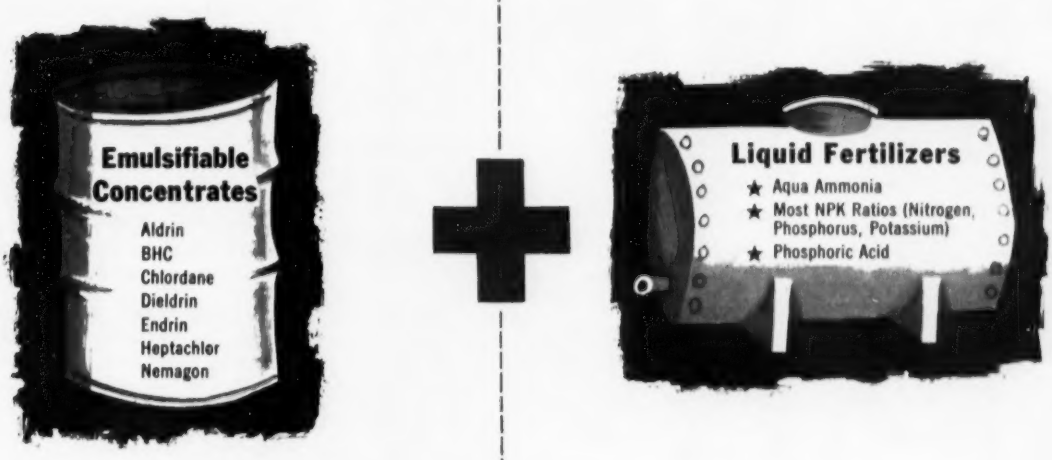
**E. I. DU PONT DE NEMOURS & CO. (INC.)**
*Polychemicals Department • Wilmington 98, Delaware*

**1616 Walnut St. Philadelphia 3, Pa.** **7250 N. Cicero Ave. Chicago 30, Ill.**

**Du Pont Company of Canada (1956) Limited 85 Eglinton Avenue East, Toronto 12, Ontario**

*with practically no limitations*

# NOW! You Can Field Mix Liquid Fertilizers and Pesticides




## *with the Versatile* EMCOLS H-A H-B *Emulsifiers*

**Further advantages of this novel system:**

1. Emulsifiable pesticide concentrates are compatible in liquid fertilizers regardless of sources of NPK (Nitrogen, Phosphorus, Potassium).
2. Emulsions are easily formed with minimum agitation.
3. Maximum flexibility is provided for controlling pesticide-fertilizer dosages in mixed crop requirements.
4. Pesticide concentrates are also suitable for conventional aqueous spray applications in case of carry-over stock.

*All these advantages make this novel system economically attractive to formulators, applicators and growers.*

*serving many other industries with dozens of EMCOL emulsifying agents . . . especially the pesticide and herbicide fields.*

Emulsol

**EMULSOL CHEMICAL CORPORATION**
division of Witco Chemical Company
Dept. CF-3 • 59 East Madison Street, Chicago 3, Ill.

Here is a lightweight, portable, automatic performer that will handle any product that establishes an angle of repose. Typical examples: rice, sugar, corn, cracker meal, poultry feeds, granite grits, salt and dry chemicals.

Bemis Packer-Ette will reduce your costs through accuracy, speed and efficiency. It is just the packer for you in any operation that does not justify a heavy-duty, permanent installation.

Packer-Ette gives you so many benefits and features that it is impossible to do more than hit the high spots here. You'll want to get all the facts. Ask your Bemis Man . . . or write us for folder and details.

## JUST LOOK . . .

**SPEED**—Up to eight 100-lb. bags per minute, depending on flow characteristics of your product.

**ACCURACY**—Plus or minus 2½ ounces or better on 100-lb. bags, depending on product characteristics. Self-aligning and self-cleaning knife edges of the scale assure consistent, accurate weights.

**OPERATING EASE**—The operator places an empty bag on the filling tube and starts the cycle by depressing the foot switch . . . that's all. The bag holder opens automatically when the filling cycle is complete. All controls are at eye level.

**BEMIS VICON® FEEDER**—A unique means of moving products from supply hopper to scale beam; a two-stage pulsating feeder tray first feeds rapidly, then at a rate which can be controlled for accuracy. When the exact weight is reached, the feeder cuts off and the filled bag is deposited automatically on the sewing machine conveyor.

**CAPACITIES**—From 25 lbs. to 150 lbs. Easily adjustable for varying bag sizes.

**TAKES LIMITED SPACE**—Width, 26″; depth, 42″; maximum over-all height, 97⅝″; minimum, 76″.

**LIGHT AND PORTABLE**—Shipping weight, 600 lbs. Portable mounting for use in various locations.

**NO INSTALLATION SERVICE**—Just move it in and plug into a 110-volt, 60-cycle line. All electrical equipment enclosed in cast-iron explosion-proof boxes.

# At last . . . big packer performance at little packer price . . .

# *The New Bemis Packer-Ette!*

Bemis

**General Offices—St. Louis 2, Mo.**
**Sales Offices in Principal Cities**

# NOW

SOUTHERN NITROGEN

Now . . .
from deep in the heart
of Dixie . . . you can
get an abundant, uninterrupted supply
of nitrogen materials
What you want . . . When you want it
that's what you have every
right to expect . . . and will always
get from Southern's NEW Savannah,
Georgia nitrogen manufacturing plant.

## WE MANUFACTURE

A wide variety of top quality nitrogen solutions and materials, mixed in the plant and served up in the cleanest, newest cars in Dixie . . .

## WE PLEDGE

A service responsibility which will always make sure that each and every customer is served with speed, efficiency and courtesy . . .

An experienced team of sales-minded production men, a sales force that can sell nitrogen materials and service with confidence; a traffic department that doesn't know how to stop trimming days, hours and minutes off delivery schedules; a technical service department that is eager to serve you with the latest know-how . . . in short, a whole new Nitrogen organization devoted exclusively to serving the Southeastern fertilizer industry in a top-notch manner never before known . . . that's Southern Nitrogen!

SOUTHERN NITROGEN

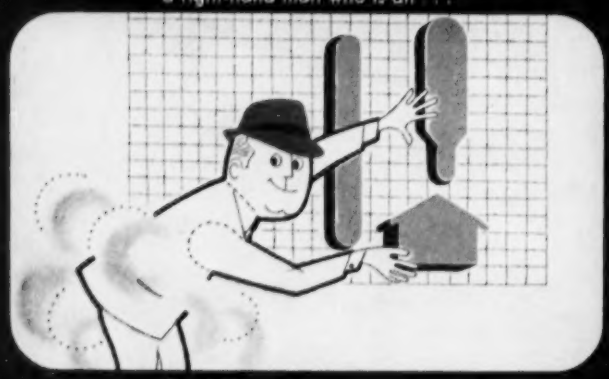
**SOUTHERN NITROGEN CO.**
INC.
P.O. Box 246 SAVANNAH, GA.
Phone ADams 3-3001

If you think
you've seen efficiency,
service and personalized attention,
just order a car from Southern Nitrogen . . .
you'll be in for a really
pleasant experience.

*Five railroads serve Savannah: The ACL, Central of Georgia, S & A, Seaboard, and Southern.*

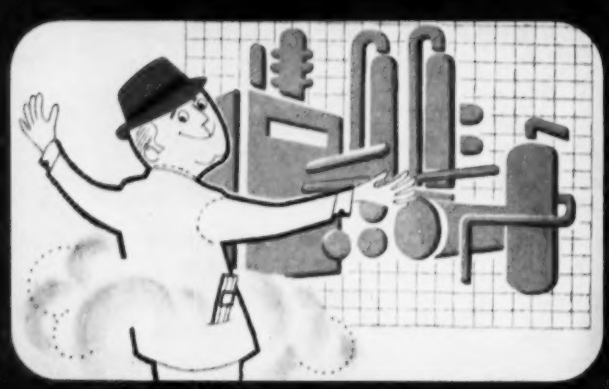
Building a new plant, mill or refinery? You need a right-hand man who is an . . .

Economist . . .



Designer . . .

Engineer . . .



Builder . . .

And here he is. Name's Lummus. When Lummus steps in, the job is off your hands, off your mind.

# LUMMUS
# Let ~~George~~ do it

Unfamiliar problems pile up fast when you start planning a new plant. To "do it yourself" is to do it the hard way . . . at the expense of time and energies diverted from regular operations. Instead, make The Lummus Company your right-hand man. From concept to startup you acquire the talents of thousands of specialists, fifty years of world-wide experience. Let the Lummus team take the whole complex job off your hands.

THE LUMMUS COMPANY
*385 Madison Avenue, New York 17, N. Y.*

LUMMUS

**ENGINEERS AND CONSTRUCTORS FOR INDUSTRY**

NEW YORK · CHICAGO · HOUSTON · THE HAGUE · LONDON · MONTREAL · PARIS

## THE MAN WITH THE ★ MULTIWALL PLAN

**UNION**
**PACKAGING SPECIALIST**
**J. R. GARMON**

# takes 40,000 lbs. off a packer's shoulders

Lifting twenty tons of filled bags a day is a lot of labor. It's inefficient, too, as a large chemicals producer learned during a recent survey of his Multiwall operation made by Union Packaging Specialist J. R. Garmon.

Garmon suggested a new system of *sliding* the customer's bags from the check-weigh scale to the bag flattener. This would not only relieve packer fatigue of manually lifting a 40,000 lb. bag load each day, but also assure full-capacity, full-time operation of the bagging equipment.

**Union Multiwall Recommendations are based on this 5-star Packaging Efficiency Plan**

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

Another recommended economy tip: redesign style, proportion, and construction of existing multiwall bags. This will result in annual savings of $1400 to $8000 for each 450 M of the various size bags used.

Such savings are not unusual when Union's 5-Star Packaging Efficiency Plan goes to work for a company. Write for complete information about this Plan. It costs nothing. There is no obligation.

**Better Multiwall performance through better planning**

union camp

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

**UNION MULTIWALL BAGS**
UNION BAG-CAMP PAPER CORPORATION
233 BROADWAY, NEW YORK 7, N. Y.

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% $K_2O$ minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

# CLOSE-UPS

NEWS OF SECTIONAL AND LOCAL ACTIVITY

## CFA Convention November 3-5

The thirty fourth annual convention of the California Fertilizer Association will be held at the St. Francis Hotel, San Francisco, on November 3, 4, and 5, 1957, according to association president Jack Baker of Los Angeles, who said that the hotel is making available all necessary facilities to take excellent care of the needs of the 600 persons who will attend.

The theme will be "Our Partnership With Agriculture," and outstanding speakers representative of agriculture and of the fertilizer industry will be featured. A panel discussion will be developed around the subject of the convention theme, Baker said.

## CFA Conference April 14-15

The Fifth Annual California Fertilizer Conference, sponsored by the Soil Improvement Committee, California Fertilizer Association, will be held on the campus of Fresno State College at Fresno, on April 14 and 15, 1957. J. H. Nelson and Earl R. Mog, both of Stockton, are co-chairmen. They report that a program is now being developed which will be of unusual interest to fertilizer company management; to fertilizer salesmen and dealers; to fertilizer research personnel of the University of California, California State Polytechnic College and other schools; the Department of Agriculture and to farm organizations and their members. These and all others interested in soil fertility and plant nutrition are urged to attend, according to Nelson and Mog.

The fertilizer Committee of the University of California will be guests of the Soil Improvement Committee at an annual joint dinner to be held at the Hacienda on Sunday evening, April 14. Chairman of the University Committee is Dr. E. Louis Proebsting, Professor of Pomology, Davis, and Millard E. McCollam, Western Manager, American Potash Institute, Inc., San Jose, is chairman of the Soil Improvement Committee. Following the formal program on Monday, April 15, technicians on the staff of Fresno State College will conduct

Arcadian® News

Volume 2 | For Manufacturers of Mixed Fertilizers | Number 3

# DOES HE BUY ALL HIS FERTILIZER FROM YOU?

## Complete Fertilizer Service Builds Exclusive Customers

**Every fertilizer manufacturer** wants plenty of exclusive customers. One way to build customer loyalty is to study trends and be a step ahead by anticipating and supplying your customers' total plant food needs.

Two important trends are evident in 1955-56 fertilizer consumption figures: **1)** The growth of the use of high-nitrogen fertilizers during a year when total mixed fertilizers remained stable. **2)** The fact that more nitrogen is sold as straight materials than in mixed fertilizers.

Mixed fertilizers used in 1955-56 contained 815,000 tons of nitrogen, while straight materials accounted for 1,137,000 tons. This is in contrast with 1,789,000 tons of phosphoric acid and 1,671,000 tons of potash in mixed goods versus 457,000 tons of phosphoric acid and 218,000 tons of potash as straight materials.

### Get More of the Market

The longer our soils are farmed, the greater the need for nitrogen along with phosphorus and potash. Experiment Stations are recommending better-balanced fertilizers. Corn and several other major crops require more nitrogen than any other plant food.

You get a bigger share of the fertilizer market when you are prepared to provide all of the mixed-goods analyses and straight materials your customers want.

When farmers buy low-nitrogen mixed fertilizer, more and more of them are supplementing this with direct-application nitrogen materials. Sell straight nitrogen materials along with your mixed goods and you build your volume as well as your leadership among farmers as a dependable, one-stop source of supply. Few farmers can get the crop profits they want by using straight nitrogen alone, any more than they can by using low-nitrogen fertilizers alone.

Nitrogen Division is prepared to assist you in enabling you to offer your customers a complete line. Many different ARCADIAN Nitrogen Solutions are available for the manufacture of every fertilizer analysis now in demand. Nitrogen Division is also the only source of all kinds of straight nitrogen materials, both solid and liquid, for direct application.

***Start now to make nitrogen a sales-builder for you. Contact Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N.Y.***

# CORN IS A BIG TONNAGE MARKET FOR FERTILIZER

**For the U.S.** as a whole, more fertilizer is used on corn than on the next four crops combined. The use of fertilizer on corn has been increasing at a rapid rate. 60% of all corn planted was fertilized in 1954, as compared to 48% in 1948. Corn that was fertilized got 38 pounds of fertilizer per acre in 1938...103 pounds per acre in 1948...and 259 pounds per acre in 1954.

Despite acreage limitations, the market for corn fertilizer is a big opportunity. Nearly 40% of the crop still gets no fertilizer. Almost half the crop gets no fertilizer at planting...less than one-third gets plow-down fertilizer...and the side-dressing market is mostly undeveloped except in the Southeast.

### An All-State Market

Corn is a fertilizer market in every state. New hybrids have extended the growth of corn further north and south and at higher and lower altitudes. Even California, which grew little corn a few years ago, keeps expanding its acreage. The only crops which compare with corn as a fertilizer market, in limited areas, are cotton, wheat, oats, tobacco, fruits and vegetables, potatoes, rice, barley and sugar beets. But, corn is the universal market.

### Figure Your Potential

If 5,000 acres of corn are grown within a 5-mile radius of the average fertilizer dealer and farmers are using the average amount of fertilizer per acre, he can sell his share of the 388-ton market. And he has a big opportunity to increase his sales of corn fertilizer. If, like tobacco growers, corn growers used fertilizer on 98.5% of their acreage, the market would jump to 637 tons. Some farmers use 500 to 800 pounds of fertilizer per acre of corn. Get the average up to 400 pounds per acre and the market in a 5-mile radius needs an additional 347 tons per year.

A recent survey of Indiana and Illinois corn growers showed that 422 of 445 used some fertilizer on corn. Only 254 of these farmers used fertilizer on oats, 242 on wheat, and 120 on legumes or pasture. Corn offers a quick and lucrative return from time spent selling fertilizer. It's a big tonnage market!

# Again we tell $3\frac{1}{2}$ Million Farmers *Fertilizer Grows Farm Profits*

**Nitrogen Division** has received many compliments on its powerful and continuing campaign to educate farmers on the importance of fertilizers under present conditions. The advertisement on the opposite page is the ninth in a series of full-page advertisements directed to the attention of millions of readers of farm magazines and designed to support the entire fertilizer industry. Others will follow. We trust that this campaign is helpful in increasing your sales. Comments and suggestions will be appreciated. Write Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N.Y.

# The bank that pays BIG profits on deposits

**Your withdrawals** depend on your deposits whether you are putting money in your bank or plant foods in your soil. But, you get a much bigger return from the plant foods you put in your soil than you do from the money you put in your bank.

For example, 100 bushels of corn withdraws from your soil only about $28 worth of nitrogen, phosphoric acid, potash, calcium, magnesium and sulphur. And, 80 bushels of oats takes out about $20 worth of plant foods.

The plant foods you deposit in your soil in commercial fertilizers pay you big returns in extra yields of profitable crops. It's good business to be as careful about keeping your soil account in balance as you are about keeping your bank account in balance.

When you figure that $1 invested in fertilizer deposited in your soil enables you to withdraw $3 to $4 in extra yields, it's easy to see that fertilizer is your best-paying investment.

Make sure you use enough of the right fertilizer for each crop this year. Test your soil. Figure out how much of each plant food your soil needs to produce the yields you want. Get the advice of your county agent and your fertilizer dealer.

NITROGEN DIVISION ALLIED CHEMICAL

***The fertilizer industry** serves the farmer. Nitrogen Division serves the fertilizer industry as America's leading supplier of nitrogen, the growth element in mixed fertilizers. Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y.*

## Fertilizer GROWS Farm Profits

**WISCONSIN PASTURE IMPROVEMENT WITH FERTILIZER**

**Average for all plots harvested in 1956**

| | No Fertilizer | 500 pounds 10-10-10 per acre |
|---|---|---|
| Pounds dry weight yield per acre | 3,224 | 6,777 |
| Pounds increase with fertilizer | | 3,553 |
| Dollar value of increase per acre | | $88.20 |

**Average for all plots, 1951-56**

| | | |
|---|---|---|
| Pounds dry weight yield per acre | 2,929 | 6,363 |
| Pounds increase with fertilizer | | 3,434 |
| Dollar value of increase per acre | | $85.85 |

# *Big Return from Fertilizer in Wisconsin Pasture Tests*

**$88.20 in extra dry weight** per acre was the average return from 500 pounds of fertilizer, in hundreds of farm demonstrations in Wisconsin in 1957 reported by the Extension Service. The fertilizer was applied in the early spring on permanent and rotation pastures, as a part of a 6-year study of pasture fertilization.

In calculating the results of these tests shown in the chart above, the University of Wisconsin considered dry weight yield of forage as 30% of the measured green weight. Value of the increased dry weight of forage with fertilizer was arrived at by considering the dry weight equivalent to 18% dairy feed worth $50 a ton. In fields where the pasture was largely timothy, and where the first clipping was at hay cutting time, the value of the dry weight of forage was figured at $25 per ton.

The greatest single increase in pasture feed production by fertilizer was on a farm where 560 pounds of 12-12-12 fertilizer produced 5,150 pounds of dry weight forage per acre. Yield without fertilizer was only 750 pounds dry weight per acre. The extra feed produced by the fertilizer figured out at $110 per acre.


## A COMPLETE LINE OF Nitrogen Products

Here is the most complete line of nitrogen products available to the fertilizer industry, made by America's leading producer of nitrogen and backed by many years of experience, dependable service and expert technical assistance:

Arcadian®

**NITROGEN SOLUTIONS:**

URANA®
NITRANA®
U-A-S*
N-dure*

**Other Nitrogen Products:**

Anhydrous Ammonia
Urea Products
A-N-L®
Ammonium Nitrate
Sulphate of Ammonia
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**NITROGEN DIVISION**
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Indianapolis 20, Ind.
Columbia 1, S. C.
Raleigh, N. C.
Atlanta 3, Ga.
Los Angeles 5, Cal.
San Francisco 4, Cal.

*Trade-mark

a tour of the new college campus.

The Conference program on the morning of the 15th will feature reports to the entire assemblage of fertilizer research findings. Following luncheon on the campus in the new students cafeteria, two panel discussions will be featured, one on potash responses, and the other on minor element deficiencies. The morning session will be held in Room 121, McLane Hall, and the panel programs will be given in this room and in Room 161, McLane Hall. Lloyd Dowler, Dean of Agriculture at Fresno State College and his associates are in charge of physical arrangements for the Conference.

## Oregon Convention Adds Fertilizer Meeting

Pacific Northwest fertilizer industry personnel have received their first invitation to attend a special half day session set as a major part of the 26th annual Oregon Feed and Seed Dealers Association planned for March 14th and 15th in Portland's Multnomah hotel.

According to general convention chairman, Tom Sullivan, this move marks the first attempt on the part of the Association to specifically establish a fertilizer program as part of the annual convention.

Fertilizer meeting chairman will be Alec Runciman, Portland, who also serves the group as fertilizer chairman. Speakers for the session will include Karl Baur, Pacific Supply cooperative, Portland, J. D. Patterson, Salem, newly elected president of the Association of American Fertilizer Control Officials and Thomas Jackson, soils department head, Oregon State college.

This portion of the convention program will open at 9:30 a.m. Thursday, March 14, and will continue through a 12 noon luncheon.

## Oregon Retailers Day Draws 125

Bankers in Oregon are inclined to give first consideration for farm production loans when farmers want to purchase agricultural chemicals, said Chet Low, Salem, Ore., banker speaking before 125 fertilizer retailers gathered on the Oregon State college campus, Corvallis, Ore.

Speaker Low was featured on the program for the second annual Retailers Day jointly sponsored by the college and the Pacific Northwest Plant Food Association. The session was held Thursday, January 17.

Low explained his statement favoring the fertilizer industry by stat-

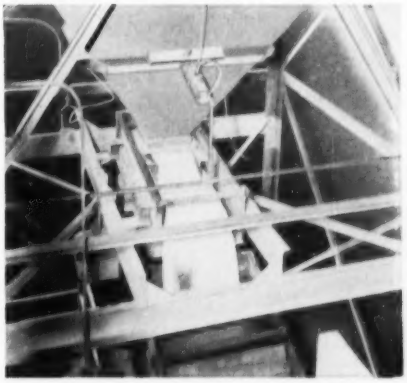
(Continued on page 50)


# TWO TOOLS

## that bring further automation to *your fertilizer production*

Handling super phosphate or other fertilizer ingredients, Simplicity Gyrating Screens combine positive action with perfect smoothness to increase your output. Simplicity Gyrating Screens are mechanically vibrated, using a counterbalanced eccentric shaft which exactly counterbalances the weight of the entire deck assembly. A 3′ x 8′ Model LS Simplicity Single Deck Screen can handle as much as 50 tons of super phosphate per hour, with virtually no blinding of the screen, and a 3′ x 6′ Simplicity Model C can handle all other fertilizer ingredients at about the same speed. Every Simplicity Screen has the actual available screening area indicated by the given dimensions.

Simplicity Os-A-Veyor Feeders can be bin-hung, as shown in the photograph, or may be spring mounted. The Os-A-Veyor feeds along its entire length and allows for the use of a larger bin, thus avoiding bridging in the bin. Simplicity Os-A-Veyor Feeders have replaceable liners and can be provided with grizzly or screen sections, one or two decks, and can be totally enclosed. Simplicity Os-A-Veyor Feeders are doing a fast, efficient job for fertilizer plants throughout America.



*Write us today for further information about Simplicity Os-A-Veyor Feeders, Gyrating Screens, Conveyors and Woven Wire Screen Cloth.*

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TRADE MARK REGISTERED

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# NEWEST NITROGEN FERTILIZER

## at your dealer's now!

Hi-D
NEW GRANULE
AMMONIUM NITRATE FERTILIZER
33.5% NITROGEN
CSC
COMMERCIAL SOLVENTS CORPORATION
THIS ADVERTISEMENT
sells new
Hi-D
Ammonium Nitrate Fertilizer. It appears in April issues of Capper's Farmer, The Progressive Farmer, Prairie Farmer, and Farm and Ranch, March issue of Florida Grower and Rancher.

**see a sample at your dealer's**

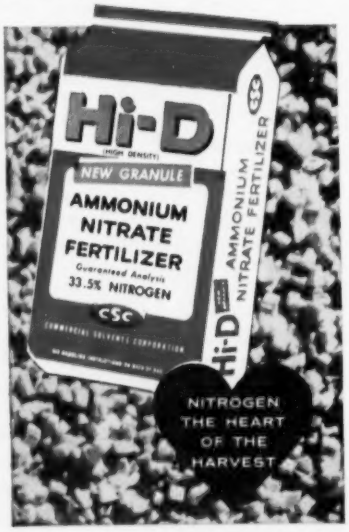
**no other ammonium nitrate like it!**

Ask your dealer for a sample. See for yourself the advantages of using new Hi-D. An exclusive patented process produces a high density ammonium nitrate with the maximum moisture "squeezed" out. Hi-D is made dry, coated dry and bagged dry. In addition, the controlled size and unique shape of these new granules assure even distribution in all types of spreading operations under all field conditions. Hi-D flows freely, spreads evenly, stays put. It won't gum-up, clog, cake or bridge even on hot, humid days.

Hi-D Ammonium Nitrate contains the 2 key types of nitrogen – the kind of nitrogen in sodium nitrate *and* the kind in ammonium sulphate as well! That's not all. 100 pounds of Hi-D gives you as much nitrogen as 159 pounds of ammonium sulphate or as much nitrogen as 209 pounds of sodium nitrate! The total nitrogen in Hi-D, guaranteed at 33.5%, gives 2-speed fertilizing action. 16.75% *nitrate* nitrogen goes to work fast for good, vigorous starts. 16.75% *ammonia* nitrogen follows up later for a sustaining boost to growth.

There's another kind of value in Hi-D, too. Its high density means less bulk – 10 bags stack in the same space as 8 bags of other types of nitrate. In the field this means you get up to 25% more nitrogen from a normal hopper load – you cover more ground per load.

Put the crop-boosting power of Hi-D to work for you this season. And remember, Hi-D should be just one part of your program for productivity. Don't forget – there's no substitute for balanced fertilizers. And, as a nitrogen supplement to the balanced fertilizer your dealer recommends, there's nothing better than Hi-D. See your dealer. Ask for Hi-D – in the green and white bag. You can trust Hi-D in the field and in the yield.




**COMMERCIAL SOLVENTS CORPORATION – STERLINGTON, LA. – ST. LOUIS, MO. – ATLANTA, GA. – TERRE HAUTE, IND.**

# WHAT TO LOOK FOR IN USED LIFT TRUCKS

*by*
R. F. Moody
*Hyster Company*

**Sizeable numbers of used lift trucks are being purchased by the fertilizer industry. They can be a good investment or a source of trouble—depending on the care with which they are selected. Here is a 19-point checklist that will help operators to get the right truck for their jobs.**

When a used lift truck is being considered for purchase, both its basic specifications and its operating condition should be carefully analyzed before a commitment is made. A reputable dealer will provide invaluable assistance, but in most instances, the potential customer knows his requirements and his plant far better than any outsider. Being aware of the factors to consider, he will be in a better position to advise the dealer of his needs.

For buying a used lift truck is not like buying a second-hand car. With a car, almost any model of any make is available in the immediate vicinity of a prospective buyer. But lift trucks are made in substantially fewer numbers than automobiles, and each truck must be matched against the jobs that it is to perform and the areas in which it is to perform them. Thus, getting the right truck for the right job is much more difficult—and requires more careful analysis—than purchase of a car that is to be used only for transportation.

Secondly, a lift truck is a piece of capital equipment. If it breaks down, more than inconvenience results: Production schedules are disrupted, time is lost, operating costs mount. So if a used truck is being bought for production operations—or even if it is to be used only for standby service—care and skill must be exercised in analyzing its condition.

### Why Buy Second-Hand Equipment?

If this is the case, why should a used truck be considered at all? New equipment is obviously more reliable, safer, and has refinements that are unavailable in used models, even though they be of recent vintage.

Of the numerous reasons, one is most important: lower first cost. The amount that can be saved by purchasing second-hand equipment depends entirely on the individual truck. Generally, used trucks are offered under one of two conditions, "as is" or "rebuilt." Actually, some manufacturers suggest three basic categories for used lift truck equipment, "as is," "good value" or "hy-quality." The "hy-quality" tag is confined to trucks that are rebuilt to factory standards and are warranted for a fixed period of time. The "good value" tag is applied to a truck that has been put in first-class operating condition but not necessarily c o m p l e t e l y rebuilt, where the "as is" truck is exactly as stated—in the same condition as it was when traded.

Most dealers do some work on trucks that are over four or five years old. If the second-hand truck that you are considering is of this age and has been reconditioned but not rebuilt, it can be expected to have a life of 60-70 percent of that of a new truck. If, on the other hand, it is only three to four years old, and again is properly reconditioned but not necessarily rebuilt, it should have a useful life of 75-85 percent of a new truck. The life of a rebuilt machine, on the other hand, should approximate 90 percent of the life of a new machine. Naturally, these are general figures and apply to the mechanical condition of a truck operated under normal conditions and receiving normal maintenance.

Yet, the cost of used equipment is not proportionate to its anticipated life. It is less. Again, how much less depends on the machine and on local circumstances. It may be as little as 30 percent, as much as 70 percent . . . but regardless of the percentage, there can be a substantial saving.

Naturally, savings are important when capital is limited, and therefore a used truck is often purchased by the small manufacturer or distributor. It allows him to mechanize his operations and save approximately the same amount of time and money as when using new equipment. Many used truck purchasers are companies that never have owned a lift truck before.

This is not always the case, however, for larger companies frequently buy used equipment to supplement existing fleets during peak production periods, either daily or seasonal. Since a used truck costs less, the depreciation that must be

**Top:** Lift truck fitted with bag handling arms picks up unpalletized stack of bagged fertilizer at sacking unit for transfer to storage or to waiting truck. **Upper center:** Lift truck in foreground has just placed caster-equipped pallet on floor of transport; pallet can then be rolled to front end of truck bed for removal of bags. Fork truck in background is standing on loading dock for direct unloading into bed of shorter transport truck. **Lower center:** Fork lift with bag handling arms attached ascends ramp to deposit stack of bags directly into closed transport. **Bottom:** Unpalletized stack of bags being moved in warehouse storage area.

**Table 1. General Truck Specifications***

| | |
|---|---|
| Type of Truck: | |
| Make: | |
| Model: | |
| Serial No. | |
| Year: | |
| Availability of Replacement parts: | |
| Rated Capacity, lbs. | |
| At Load Center, in. | |
| Load Arms length, in. | |
| Thickness, in. | |
| Width, in. | |
| Lift Height, in. | |
| Overall lowered height, in. | |
| Free lift, in. | |
| Turning Radius: | |
| Aisle Widths | |
| 90 deg. stacking, in. | |
| 90 deg. intersecting, in. | |
| Maximum Grades | |
| Percent, no load | |
| Percent, full load | |
| Operating Speed | |
| Travel speed: | |
| Lifting speed: | |
| Underclearance | |
| Under uprights, in. | |
| Under center, in. | |
| Approximate Weight: | |
| Floor Loading (With full load) | |
| Type Tires: | |
| Type Power: | |
| Accessories | |
| Guards, load: | |
| Overhead: | |
| Power steering: | |
| Automatic transmission: | |
| Hour meter: | |
| Fire extinguisher: | |
| Towing hook: | |
| Others: | |
| Special Attachments | |
| Boom: | |
| Scoop: | |
| Hydraulic clamp: | |
| Others: | |

*Hyster Company

charged against it as overhead when it is not working is much less than what might be charged against a new machine, and therefore a used truck frequently provides a good answer to the "standby" equipment problem.

Still another reason for buying a used lift truck is to fulfill production requirements while waiting on new equipment. In today's market, delivery of some models of lift trucks, particularly those requiring a large amount of special engineering, are available only on several month's delivery. Utilizing a second-hand truck to meet immediate production demands is often the most economical solution to this problem.

**How to Get the Right Truck**

The first requirement for a lift truck—either new or used—is that it be adaptable to the job the prospective buyer has in mind and that it be capable of operating efficiently in his plant, yard, or warehouse. Therefore, the same basic conditions that must be analyzed when selecting a new truck apply also to a used one:

**(1)** Obviously the truck must have the rated capacity to lift the loads in the potential buyer's plant. Most buyers like to obtain a machine rated at somewhat higher capacities than the maximum size load that they normally encounter just in order to be safe. This is good practice, but there is a limit, for the efficiency of a truck is greatest when the loads that are handled are closest to the machine's rated capacity. Operating costs, too, are less.

But capacity is not the entire story. Trucks are rated at a capacity of a given load center, generally 24 inches. This means that if the normal load is wider than 48 in., the truck capacity is decreased. So, this is an important factor to check—namely, rated capacity at the required load center.

**(2)** Other basic considerations are lowered mast height and truck stacking height. On occasion, buyers have purchased lift trucks only to find that the lowered height of the machine was higher than their doorways and thus that there was no way to get the truck from one area of the plant to another . . . or that the truck was incapable of stacking to the desired height, thus wasting valuable warehouse or storage space.

**(3)** The amount of under-clearance affects the areas in which a truck can be used, and here there are two requirements, as shown in Table I —namely, the under-clearance under the uprights and also under the center of the frame. Too little clearance may cause the truck to "hang-up" on ramps or in yards.

**(4)** Floor loading is important, particularly in older plants, so the total weight of the truck with and without load should be considered before purchase. There is actually no way of quickly determining the structural capacity of an old building other than to refer to construction prints if they are available, or to make an engineering survey. However, obviously it would not be wise to buy a 10,000-lb. capacity truck that would weigh on the order of 13,600 lb. and carry a 10,000-lb. load without carefully checking the ability of the floor and building to carry it.

The determining factor, of course, is not total weight but rather its distribution; a four-wheeled machine with pneumatic tires will distribute weight and load over more floor area than a similar machine with solid or cushion tires. Checking with the dealer on both of these considerations is a wise precaution.

If the truck is to be used in an elevator, then weight alone is the dominant characteristic, whereas if the vehicle will operate inside of a trailer, both weight and floor loading are important.

**(5)** Finally, the type of tires that are on the truck govern to a large extent where it can be used. Solid-tired machines, for example, are not adaptable for outdoor use. Pneumatic tired machines can be used either in or out of doors, as can, to a lesser extent, a solid-cushion machine. Again, these are points to consider when looking at a second-hand truck.

Naturally, there are many other considerations (Table II). Some of these may be unimportant in particular applications — others may govern whether or not the truck can be used successfully. But in any case, they should be carefully checked if maximum benefit is to be obtained from a used machine.

**How to Determine Truck Condition**

Over and above the factor of ability to meet a given requirement is the mechanical condition of the truck being considered. There are many points that should be checked here, perhaps the most important of which is that the purchaser buy from a dealer who represents a well-known and reputable lift truck manufacturer. But more than that, any dealer likes his customer to know precisely what he is getting. There is less possibility for misun-

derstanding . . . both parties to the transaction are satisfied after the sale is made. Among the things that can be checked are the following:

**(6)** If the truck has been reconditioned and is warranted, obviously used parts are available. If, however, it is offered in the "as is" condition, the prospective buyer should determine whether replacement parts can be obtained. Depending on the manufacturer, service parts generally are available for machines ranging from 10 to 20 years old. However, they may not be available from stock for the older machine, and this will involve a delay if the truck breaks down. It always is wise to check to inquire if the dealer has a replacement parts book that lists the parts for the particular truck in question . . . and what parts he has in stock.

**(7)** The manufacturer's name is an important consideration. Like many other industries the fork truck industry has consolidated, and some trucks were made in earlier years that are no longer on the market. A used truck with an obsolete name is a poor buy.

**(8)** A rebuilt truck, of course, is usually in better condition than one that is offered "as is." Generally, it has been steam-cleaned and painted; the frame has been repaired by welding, if necessary; it has a new clutch and new brake lining; the engine has been rebuilt; the hydraulic system has been overhauled; wheel bearings have been checked and packed; tires are in good condition and other components have been checked and repaired. In some instances, however, an "as is" truck is an excellent buy; unusual circumstances may have required the former owner to trade it in. If his name can be determined, he can be asked. Otherwise, the general reputation of the dealer can be relied upon. He is a businessman, and probably has hopes of selling the used truck buyer new machines at some future date. He wants a satisfied buyer as much as the buyer wants a good used truck.

**(9)** Most used trucks do not come equipped with attachments other than forks. This, of course, is not always the case. A machine may have mechanical or hydraulic attachments which, if they can be used, are a "plus" in the sale.

However, the buyer who purchases a used truck with the idea of fitting a new hydraulic attachment to it sometimes is faced with a costly or possibly an insurmountable problem. Current attachments may not be adaptable to obsolete trucks. Thus, a very cautious approach is recommended when purchasing a used machine to which a new hydraulic attachment is to be fitted. With mechanical attachments, the problem is usually much simpler.

**(10)** A visual check of the truck is obviously wise. Unless the prospective buyer knows the dealer well, it is wise to look at the truck in question rather than merely at a picture. Its general appearance, cleanliness, and absence or presence of waste, dirt, and grease is a good

**Table II. Condition Checklist for Used Lift Trucks**

VISUAL INSPECTION

General Appearance: Good ..... Bad .....
Paint: Good ..... Bad .....
Fenders: Damaged ..... Good Condition .....
Guards: Damaged ..... Good Condition .....
Other: .....

Uprights:
Condition: Good ... Repaired ... Damaged ... Rollers ... Slides ...
Chains: Drive Chains ..... Sprockets ..... Hoist Chain(s) .....

Frame:
Condition: Out of Line ... Welded ... Repaired ... Needs Repair ... Good ...

Tires:
Type: .....
Condition: Load (Front) ..... Steering (Rear) .....

OPERATIONAL INSPECTION

Engine:
Make ..... Model ..... Serial ..... Number of Cylinders .....
Condition: Good ... Bad ... Smoking ... Noisy ... Knocking ...
Needs: Replacing ... Overhauling ... Minor Adjustment ... Nothing ...

Clutch:
Condition: Slips ... Grabs ... Needs Replacing ... Needs Adjustment ...

Transmission:
Operated in each of these speeds Forward: 1 ... 2 ... 3 ... 4 ... 5 ...
Operated in each of these speeds Reverse: 1 ... 2 ... 3 ... 4 ... 5 ...
Condition: Noisy ... Good ... Needs Adjustment ... Needs Replacement ...

Differential:
Condition: Noisy ... Good ... Needs Adjustment ... Needs Replacement ...

Hydraulic System:
Hoist Cylinder: Leaking ... Good ... Needs Repacking ... Bad ...
Tilt Cylinder(s) Leaking ... Good ... Needs Repacking ... Damaged ...
Pump: Good ..... Noisy ..... Leaking ..... Slow Acting .....

Valves: Good ..... Leaking .....

Steering:
Condition: Play in Wheels ... Hard to Steer ... Damaged ... Repaired ... Good ...

Electrical System:
Battery: Good ..... Needs Replacement .....
Starting Motor: Good ..... Slow ..... Spark .....
Generator: Good ..... Sparks ..... Needs Brushes .....
Lights: Operative ..... Inoperative .....
Wiring: Good ..... Frayed .....

Miscellaneous:
Radiator: Good ..... Leaks ..... Overheats .....
Horn: Operative ..... Inoperative .....
Instruments: Operative ..... Inoperative .....

Remarks: .....

indication of how well the truck has been maintained.

**(11)** Mechanical condition is, of course, very important.

Among other things that the buyer will want to check will be the action of the clutch pedal to determine whether it has the proper amount of "free pedal travel"; too much may indicate a worn clutch.

The steering column should be checked for play, and if the truck is equipped with power steering, the operation should be checked without a load on the forks—generally the most severe condition.

The truck should, of course, be driven and the condition of the brakes can be determined. Driving it over rough ground will shake off any parts that are loose and indicate serious structural defects. Driving it up a grade to see if the engine maintains power is recommended, and during tryout, the prospective buyer should drive it through each gear ratio to determine the condition of the transmission.

**(12)** When the truck is being driven, the operator should speed it up and decelerate it abruptly to determine if there is play in the gears. Alternate deceleration and acceleration will cause a "clunk" if the transmission is in poor condition.

**(13)** The truck should be checked under load to make sure that the lift mechanism works properly and that it will support the rated load. The tilt mechanism should be checked at the same time. Running the truck through the lift and tilt cycle will indicate if the relief valve is kicking out properly at the end of the tilt or lift cycle, and also if there is wear in the valves or packing. A good approach is to make this test on a clean surface or a piece of kraft paper. Oil leakage will show up immediately.

**(14)** Naturally operation of the engine should be analyzed by several means. One way is to use a compression gage, which will indicate if there is valve leakage or if the rings are worn or cracked. Putting a vacuum gage on the engine intake manifold will also indicate the condition of the valves. A very simple check can be made by removing the oil "dip stick" and visually inspecting the condition of the oil.

Allowing the truck to idle for 15 to 20 minutes is also a wise precaution. If it overheats, the cooling system may be defective. At the same time, the water in the radiator should be checked for rust and scale . . . the hose should be inspected for cracks . . . all connections should be visually inspected for stains that would indicate leakage.

**(15)** The speed of the lift is an indication of the condition of the hydraulic system. If the hoist cylinder rises slowly, the pump may be worn. Likewise, if the hydraulic fluid becomes hot, the pump may be in bad condition. Above all, it is wise to make sure that the lift and tilt cylinders are not scored and that the flexible connections in the hydraulic system do not show signs of wear.

**(16)** The condition of the uprights is important since they support the load. If they are damaged or bent, they may not be capable of supporting the rated load of the machine. This should be determined. So should the condition of the load rollers, and side rollers, for excessive side play would indicate replacement. Naturally, all bushings and bearings should be checked, particularly those that act as pivot points on the machine. The condition of the steering spindles can be determined by looking to see if they are worn and still in one piece, or if they are ball or roller bearing types to determine if any balls are missing from the races.

**(17)** The electrical system—particularly the generator, battery, and distributor—should be visually inspected. Starting the engine will indicate the condition of the starting motor. If it kicks over fast, the starting motor probably is in good condition; if it turns the engine over slowly, either it may have to be reconditioned or the battery may have to be replaced.

It is an easy matter to take the bank off the generator to determine if the brushes are sparking, just as it is a simple matter to check the wiring for frayed or worn condition. And a visual check of the battery, while not fool-proof, may indicate if a new one is required.

**(18)** The condition of the truck tires is, of course, important, for tires are expensive. If the sidewalls are badly notched or bruised, new tires may be required. If, on the other hand, the tread is worn thin and the tires have not previously been recapped—this can be determined by looking for separations along the outer rim—recapping may solve the problem. Actually, an industrial truck pneumatic tire can be recapped several times.

Solid cushion tires present another problem. Badly worn units cannot be recapped—they must be replaced—but tread is no indication since there is little tread on a solid cushion tire to begin with. Points to check are the thickness of the tires, the condition of the bond between the rubber and the wheels, and the absence or presence of "chunked-out" sections.

But equally important is the type of tread on the tires and the size of tires with which the truck is fitted. If the truck is to be used

**Top:** Lift truck with standard forks stacking 2-way pallets of bagged goods in open-front storage shed. **Center:** Lift truck picks up bags stacked on 4-way (can be picked up from all four directions) pallets in ground level warehouse. **Below:** Fork lift hoists pallet to trailer deck for bags to be transferred.

indoors, obviously an outdoor rough tread is not desirable. Conversely, if it is to be used outdoors, a smooth indoor tread may or may not perform satisfactorily, depending on the climate.

**(19)** There are many other points to analyze—the condition of grease fittings . . . condition of instruments . . . the condition of lights, if they are available in the truck . . . and last, but not least, the condition of the horn. This is a small accessory and relatively inexpensive, but it is surprising how many times a horn is inoperative.

**Close Checks Pay Off**

All this sounds complicated . . . but the plain fact is that it sounds more complicated than it is. And any energy that the prospective buyer expends in making sure that he is getting the truck that he wants, in the operating condition that he wants it, is well worth the investment. For a used truck may cost from a few hundred to several thousand dollars, and not only the manufacturer who made the truck but the dealer who is selling it will prefer to have a satisfied to a dissatisfied customer. The checklist may be the difference between the two.

## CFA Opposes Elemental Basis

The California Fertilizer Association is on record as opposing the proposed change in fertilizer guarantees from the oxide to the elemental basis on phosphorus and potassium. The association's board of directors, by a vote of 11 to 1, took this action on January 11, at a meeting held in Los Angeles.

The belief was expressed that the change, as proposed by the American Association of Fertilizer Control Officials, would make for confusion in the minds of the farmer and many within the industry itself. It was pointed out that in connection a 10-10-10 fertilizer, for example, the values in $P_2O_5$ and $K_2O$ are well known, and should not be changed at this time.

## Hydroponics Book Of Interest

A new book, entitled "Successful Gardening Without Soil" and devoted to the subject of water culture has been written by C. E. Ticquet, secretary of the Soilless Culture Society, and published in America by Chemical Publishing Co. Inc., 212 Fifth Avenue, New York. The price is $2.75 per copy.

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**Left:** On the annual Fertilizer Evaluation Conference program or in attendance were: Dr. D. A. Hinkle, head of the Agronomy Department, University of Arkansas; B. L. Baird, agronomist, North Carolina State College; Dr. T. E. Tramel, agricultural economist, Mississippi State College; Jack L. Knetsch, agricultural economist, TVA; Doctors J. D. Lancaster, agronomist, and C. D. Hoover, head of the Agronomy Department, Mississippi State College; and Dr. H. A. Curtis, board member and former chemical engineer, TVA.

**Right:** Chatting are O. H. Long and Dr. L. F. Seatz, agronomists, University of Tennessee; Dr. N. T. Coleman, agronomist, North Carolina State College; and Walter E. Brown, TVA fertilizer researcher.

# 80 ATTEND EVALUATION CONFERENCE

About 80 soils and fertilizer experts from 21 states and the U. S. Department of Agriculture attended the annual Fertilizer Evaluation Conference held at Wilson Dam, Alabama, January 23-25.

The conference is a joint meeting between the Fertilizer Work Group of the Southern Regional Soil Research Committee and state experiment station-TVA cooperators. The latter group reported on results with the various TVA fertilizers from states regionally located across the nation. The Fertilizer Work Group discussed progress in regional rock phosphate and sulfur projects.

Results in pasture production by Texas soils researchers showed that annual applications of 30 pounds of phosphate as superphosphate was superior to phosphate applied in the form of basic slag or rock phosphate. There the object was to grow a uniform and high production of forage containing much protein and enough phosphorus for beef cattle. F. L. Fisher of Texas A. and M. Agricultural Experiment Station reported on this project.

Dr. Eugene Doll, University of Kentucky, Lexington, reported that salts applied in conjunction with concentrated superphosphate increased the phosphorus availability. This was compared to equal amounts of phosphorus applied alone in broadcast or in band-placed applications.

Dr. H. A. Curtis, member of the TVA Board and prominent chemical engineer, discussed "Rock Phosphate and Its Treatment with Sulfuric Acid." In his talk, Dr. Curtis advanced his own theories about how phosphate was laid down geologically millions of years ago. He gave reasons why his ideas differ somewhat from commonly accepted beliefs. He also observed that the treatment of rock phosphate with sulfuric acid in order to obtain phosphate fertilizer dates back years earlier than the date commonly accepted. He added, "There is still much to learn about rock phosphate processing."

### Liquids On Move

A. V. Slack, chief of the Program Development Staff, TVA, discussed trends in commercial production of liquid mixed fertilizers. The number of plants making liquid fertilizers has almost doubled the past year. The growth pattern is that of small plants of 1,000 to 3,000 tons annual production setting up to serve local areas.

Other TVA researchers on the liquid fertilizer panel were J. M. Stinson and M. R. Siegel of the Division of Chemical Development. Mr. Siegel told the soils and plant researchers of a method for using "wet-process" or "green" phosphoric acid to produce satisfactory, low-cost liquid fertilizers. A suspension-type 8-24-0 liquid fertilizer made from wet acid was applied satisfactorily with ordinary pesticide equipment. This was on a TVA test-demonstration farm in cooperation with the Kentucky Agricultural Extension Service last year.

Mr. Stinson told the audience about the development and properties of a superphosphoric acid that contains about half again as much phosphate as ordinary phosphoric acid. The new acid is much less corrosive, and when reacted with ammonia gives a liquid fertilizer of much higher concentration than that produced with commercial acid.

One product of superphosphoric acid was 8-36-0 liquid fertilizer, which compares with the standard 8-24-0. It looks promising for use in making other fertilizers, and probably can be shipped at less cost than other phosphoric acids of lower concentrations.

In yield tests between liquid and solid or dry TVA fertilizers, the liquids were equally as good or better than comparable fertilizers applied as a solid. Dr. J. D. DeMent of TVA's Division of Agricultural Relations said that dry matter greenhouse yields showed less difference in the case of diammonium phosphate. Placing the fertilizer in bands slightly beneath the soil surface was much more effective than when fertilizer was mixed with the soil.

### Phosphorus Uptake

Dr. A. J. Ohlrogge, Purdue University agronomist, presented a novel method of measuring phosphorus uptake by plants throughout the early growth period by use of radioactive phosphorus. Dr. Ohlrogge presented data which show that the salts applied in conjunction with concentrated superphosphate are quite important in influencing uptake of phosphorus during early growth of the plant. He also reported that in many cases this early phosphorus uptake influences the final yield of the crop. Dr. Ohlrogge laid particular stress on the effect of this early phosphorus uptake when the fertilizer was applied to corn in the row.

One session was about how fertilizer nutrients react with the soil and move into the plant. Among speakers who discussed this fundamental research on soil-plant fertilizer-plant relations were Dr. M. Fried of the Agricultural Research Service, USDA, and Dr. N. T. Coleman, of North Carolina State College.

Another USDA speaker who appeared on this part of the program was W. L. Hill of the Agricultural Lime Section, Beltsville, Md. He spoke on the relation of associated salts to the availability of phosphorus to the plant.

B. L. Baird, North Carolina State College soils researcher, and Dr. T. E. Tramel, Mississippi State College agricultural economist, told the convention delegates about agronomic-economic studies. In this research,

different returns per dollar invested in fertilizer—all considering varied conditions of soil, yield, pounds of fertilizer applied, and other factors —are studied.

Preparation and properties of slowly soluble potassium fertilizers were outlined and plans were considered for studying these materials in the field. The materials now being produced for experimental purposes on a pilot-plant scale include fused potassium-calcium pyrophosphate of low water-solubility, and potassium metaphosphate which may contain low to high proportions of potassium in water-soluble form.

Agronomists are interested in potassium fertilizers of relatively low water-solubility because such materials may help to control potassium leaching on sandy soils. These materials may also be of interest in connection with the problem of luxury feeding. Also, salt effects associated with high applications of conventional potassium fertilizers are worthy of study in connection with these newer types of materials.

**Discuss Lime Project**

The members who represent the Southern Regional Soil Research Committee at the conference discussed plans for their southern regional lime project. Its estimated duration is 10 years, and it will include a study of how much crops respond to lime, how often reliming is necessary, and how soils change in relation to the amount of lime applied.

The liming situation has grown steadily more important as farmers in the South have shifted away from a cash cropping system to one that is more balanced and diversified, and that includes livestock. Farm livestock programs require legume seedings with heavier application of lime to the soil.

Project leaders of the southern regional lime project include: H. V. Jordan, State College, Miss.; E. H. Stewart, Clemson, S. C.; O. L. Bennett, Thorsby, Ala.; C. L. Parks, Marianna, Ark.; A. E. Royer, Fleming, Ga.; and W. E. Adams, Athens, Ga. Work on the project will be conducted in Alabama, Arkansas, Georgia, Mississippi, South Carolina, and Puerto Rico.

Dr. L. E. Ensminger, agronomist on the staff of Alabama Polytechnic Institute, Auburn, and Dr. George Stanford, chief of the Soils and Fertilizer Research Branch of TVA's Agricultural Relations Division at Wilson Dam, were co-chairmen for the meeting.

# FARMER COOPERATIVES DID $9.6 BILLION IN 1954-55

Farmer cooperatives did a net business of $9.6 billion in fiscal year 1954-55. This amounts to an increase of 1.4 percent over the $9.5 billion in 1953-54. These statistics, based on its latest annual survey, have been compiled by USDA's Farmer Cooperative Service.

This net value, in effect, represents business done at the local level since it eliminates duplication resulting from business done between cooperatives. Marketing volume made up $7.4 billion of the total net business, farm supply volume $2 billion, and related services $195 million.

The number of cooperatives in 1954-55 was 9,887 compared with 10,058 in the preceding year. The decrease reflects the continuing trend toward consolidation among cooperatives. Some of these cooperatives, however, had ceased operations earlier. This should have been recorded in prior years, but their discontinuance was not disclosed before the current survey.

The number of memberships in farmer cooperatives amounted to 7,602,140 compared with 7,607,660 in 1953-54—a decrease of less than one-tenth of 1 percent. This is considerably less than the more than 2 percent average yearly decrease in number of farms occurring between 1950 and 1954.

The West North Central region—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas—again led in the number of cooperatives, with 3,890. These cooperatives had memberships of almost 2.3 million and did a net business valued at more than $2.4 billion.

Second in number of cooperatives was the East North Central region —Ohio, Indiana, Illinois, Michigan, and Wisconsin. The 2,026 cooperatives in this region had memberships of a little more than 2 million and led all regions in the business they transacted with a net total of slightly less than $2.5 billion.

Minnesota still had the largest number of cooperatives—1,296. Next in number of cooperatives was Wisconsin with 808, followed by Iowa with 703.

Illinois continued to lead in number of memberships, with 584,470. Minnesota ranked second with 573,020, and Missouri was third with 433,720.

California led the nation in value of business transacted. With 451 cooperatives and a membership of 121,010, California had total business with a net value of slightly more than $829 million. Minnesota was second with a net business valued at more than $645 million, and Illinois was third with a net business of more than $620 million.

(See table next page)

**Estimated business in specified commodity and service groups of marketing, farm supply, and related service cooperatives, 1954-55[1]**

| Item | Number of cooperatives handling | Gross business ($ 1,000) | Net business after adjusting for duplication[2] ($ 1,000) |
|---|---|---|---|
| Total farm products marketed for patrons | 7,098[3] | 9,297,774 | 7,377,925 |
| Supplies purchased for patrons: | | | |
| Building material | 1,457 | 99,901 | 67,255 |
| Containers | 1,114 | 50,281 | 22,640 |
| Farm machinery and equipment | 1,776 | 93,595 | 64,773 |
| Feed | 4,292 | 1,071,155 | 807,420 |
| FERTILIZER | 3,810 | 396,877 | 249,898 |
| Meats and groceries | 921 | 53,716 | 46,374 |
| Petroleum products | 2,681 | 731,210 | 465,668 |
| Seed | 3,556 | 139,017 | 99,683 |
| Sprays and dusts (farm chemicals) | 1,874 | 44,731 | 31,857 |
| Other supplies | 4,311 | 239,613 | 164,286 |
| Total farm supplies | 7,208[3] | 2,920,096 | 2,019,854 |
| Receipts for services | 4,802[3] | 195,479[4] | 195,479[4] |
| TOTAL BUSINESS | 9,887[3] | 12,413,349 | 9,593,258 |

[1] Preliminary.
[2] Does not include business between cooperatives.
[3] Adjusted for duplication arising from multiple activities performed by many cooperatives.
[4] Charges for services in which no duplication occurs.

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**Estimated number of cooperatives, memberships, and business of marketing, farm supply, and related service cooperatives, by States, 1954-55[1]**

| State | Number of cooperatives with headquarters in State | Number of memberships in State | Net business after adjusting for duplication[2] |
|---|---|---|---|
| | | | $ 1,000 |
| Maine | 23 | 23,830 | 42,784 |
| New Hampshire | 11 | 9,000 | 21,678 |
| Vermont | 34 | 21,750 | 67,369 |
| Massachusetts | 39 | 32,190 | 62,588 |
| Rhode Island | 4 | 3,890 | 11,397 |
| Connecticut | 31 | 17,120 | 49,812 |
| NEW ENGLAND | 142 | 107,780 | 255,628 |
| New York | 396 | 160,600 | 442,418 |
| New Jersey | 77 | 37,990 | 149,178 |
| Pennsylvania | 186 | 172,790 | 289,972 |
| MIDDLE ATLANTIC | 659 | 371,380 | 881,568 |
| Ohio | 294 | 384,890 | 587,073 |
| Indiana | 152 | 427,630 | 403,308 |
| Illinois | 540 | 584,470 | 620,127 |
| Michigan | 232 | 200,820 | 292,108 |
| Wisconsin | 808 | 411,560 | 550,093 |
| EAST NORTH CENTRAL | 2,026 | 2,009,370 | 2,452,709 |
| Minnesota | 1,296 | 573,020 | 645,173 |
| Iowa | 703 | 414,280 | 561,596 |
| Missouri | 274 | 433,720 | 289,115 |
| North Dakota | 533 | 255,660 | 239,191 |
| South Dakota | 316 | 157,530 | 155,668 |
| Nebraska | 408 | 245,910 | 274,152 |
| Kansas | 360 | 179,800 | 272,144 |
| WEST NORTH CENTRAL | 3,890 | 2,259,920 | 2,437,039 |
| Delaware | 15 | 22,470 | 20,836 |
| Maryland | 65 | 73,720 | 92,999 |
| District of Columbia | 1 | [3] | [3] |
| Virginia | 133 | 240,330 | 139,591 |
| West Virginia | 78 | 80,810 | 39,569 |
| North Carolina | 86 | 349,920 | 118,012 |
| South Carolina | 35 | 57,180 | 21,356 |
| Georgia | 81 | 126,810 | 49,474 |
| Florida | 99 | 22,990 | 180,627 |
| SOUTH ATLANTIC | 593 | 974,230 | 662,464 |
| Kentucky | 73 | 321,120 | 150,728 |
| Tennessee | 138 | 173,720 | 74,921 |
| Alabama | 48 | 124,380 | 35,534 |
| Mississippi | 127 | 133,370 | 124,783 |
| EAST SOUTH CENTRAL | 386 | 752,590 | 385,966 |
| Arkansas | 119 | 77,560 | 93,781 |
| Louisiana | 57 | 29,890 | 41,815 |
| Oklahoma | 197 | 159,690 | 157,340 |
| Texas | 526 | 246,610 | 430,401 |
| WEST SOUTH CENTRAL | 899 | 513,750 | 723,337 |
| Montana | 177 | 63,620 | 105,980 |
| Idaho | 99 | 55,110 | 98,782 |
| Wyoming | 23 | 14,360 | 21,470 |
| Colorado | 129 | 67,640 | 149,530 |
| New Mexico | 12 | 6,460 | 31,919 |
| Arizona | 12 | 56,660 | 20,527 |
| Utah | 75 | 30,510 | 74,892 |
| Nevada | 4 | 390 | 2,871 |
| MOUNTAIN | 531 | 294,750 | 505,971 |
| Washington | 191 | 122,430 | 295,366 |
| Oregon | 119 | 74,930 | 163,977 |
| California | 451 | 121,010 | 829,233 |
| PACIFIC | 761 | 318,370 | 1,288,576 |
| UNITED STATES | 9,887 | 7,602,140 | 9,593,258 |

[1] Preliminary.
[2] Does not include business between cooperatives.
[3] Membership is credited to States in which it is located, farm products to States in which they originated, and farm supplies to States in which they are sold.

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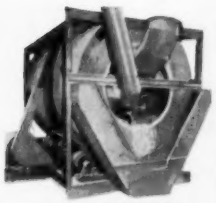

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**LOWER DRYING COST**
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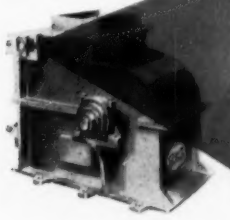

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# Midwest Agronomist-Industry Meet Draws 700

Still growing in size and importance is Middle West Soil Improvement Committee's annual joint meeting of college agronomists with fertilizer industry representatives.

The ninth annual affair last month attracted more than 700 delegates from nearly all sections of the nation. The conference is scheduled to follow a two-day session of agronomists from the 13 corn belt states, and is designed to foster closer working relationships among college and extension personnel, fertilizer manufacturers, materials producers and applicator manufacturers.

At the February 14-15 meeting, held at Chicago's Edgewater Beach Hotel, a splendid program covering new research—and including other important crops in addition to corn—kept each session packed almost to capacity. Zenas H. Beers, executive secretary of MWSIC, along with George Barclay and Charles Trunkey of the MWSIC staff, were on hand to see that the program flowed smoothly, while Kermit Berger of Wisconsin, chairman of the Middle West Agronomists, turned in another masterful job of presiding, and managed to keep each session on a stop-watch schedule.

The conference got under way promptly on the opening day with a hearty welcome from MWSIC President R. E. "Dick" Bennett of Farm Fertilizers, Omaha.

**Puhr**

Hay yields were boosted as much as two and one-half tons per acre and protein production increased by 793 pounds in South Dakota tests, when brome grass was fertilized with nitrogen on irrigated fields, according to the report of Dr. Leo F. Puhr, South Dakota State College agronomist.

In these tests at the Redfield, S. D. experiment farm, the addition of 160 pounds of nitrogen fertilizer per acre boosted brome hay yields to 6,980 pounds per acre, compared to 1,640 pounds per acre on unfertilized fields. When 80 pounds of nitrogen was added, brome hay yields were increased by 2,770 pounds per acre and the protein production boosted by 360 pounds per acre, he advised. The hay increase was 950 pounds per acre from 40 pounds of nitrogen and the protein increase was 118 pounds.

Fertilizer's carryover power gave 1956 barley yields as high as 47.8 bushels per acre, in other tests, where nitrogen-phosphate fertilizer was added for corn in the spring of 1955, on soil already high in potash.

The 47.8 bushel barley yield came from plots getting 1955 fertilizer applications that contained 80 pounds of nitrogen and 60 pounds of phosphate per acre. Barley yields were 40.5 bushels per acre when the preceding year's plant food application contained 60 pounds of nitrogen and 60 pounds of phosphate. The yields were 33.5 bushels when the fertilizer contained 40 pounds of nitrogen and 60 pounds of phosphate.

Fall fertilization of wheat and other small grains has given highly favorable results and is now a recommended practice in South Dakota, Dr. Puhr said.

Fall-fertilized wheat outyielded spring-fertilized wheat in 1955 tests in Brookings county, N. D., he added. The fertilizer was broadcast on top of fall-plowed land, both in the fall and in the spring and was disced into the soil prior to spring seeding.

Dr. Puhr said that nitrogen added to plowed-down corn stalks or straw helps speed the breakdown of the crop residues into organic matter, helps improve the soil's physical condition and maintain fertility. Adding 25 or more pounds of nitrogen per acre with straw produced "significant increases in wheat yields."

**Barber**

An Indiana agronomist reported that row fertilization needs to be reinforced by broadcast applications of plant food for top yields of corn. Dr. Stanley A. Barber, of the Purdue University agronomy department, cited phosphate fertilization tests with corn which indicate that "we are unable to get our top yield by using only row fertilizer."

The need for additional phosphate, he said, is probably due to the fact that in the later stages of growth, corn roots penetrate considerably below the row-applied fertilizer and therefore require a supply of nutrients elsewhere in the soil.

He said that while formerly most of the fertilizer was applied in the row, greatly increased per-acre rates of application in recent years have encouraged the trend toward adding at least part of the plant food by the broadcast method.

"In Indiana," Dr. Barber said, "we have obtained a fairly good relationship between soil test levels and the response of the crop to fertilizer. We have gone one step further and used the soil test as a basis to characterize the soils with respect to their relations with phosphate and potash. That is, all soils testing low in phosphate would tend to 'fix' about the same amount and therefore would show the same carryover effect from phosphate fertilizer applications."

In the tests which began five years ago, Purdue agronomists established three different levels of

## On the Platform at MWSIC Meeting

W. A. Albrecht, Chairman, Department of Soils, University of Missouri, Columbia.

S. A. Barber, Associate Professor of Agronomy, Soil Fertility Section, Purdue University, LaFayette, Ind.

K. C. Berger, Chairman, Middle West Agronomists; Professor of Soils University of Wisconsin, Madison.

Z. H. Beers, Executive Secretary, Middle West Soil Improvement Committee, Chicago.

L. F. Davis, Professor of Soil Science, Michigan State University, Lansing.

W. H. Garman, Chief Agronomist, National Plant Food Institute, Washington, D. C.

W. C. Hulburt, Agricultural Engineer, Agricultural Research Service, USDA, Beltsville, Md.

R. M. Merrill, Chairman, Fertilizer Application Machinery subcommittee, Farm Equipment Institute; Product Research Department, Deere and Company, Moline, Ill.

Walter J. Mumm, Crows Hybrid Corn Company, Milford, Ill.

A. J. Ohlrogge, Associate Professor of Agronomy, Soil Fertility Section, Purdue University, Lafayette, Ind.

L. F. Puhr, Professor of Agronomy, South Dakota State College, Brookings.

C. M. Woodruff, Associate Professor of Soils, University of Missouri, Columbia.

## Commercial Fertilizer Staff Pictures from Midwest Meet

1. W. H. Garman, National Plant Food Institute, Washington, and Morris Newman, Price Chemical Co., Louisville. 2. George Scarseth, American Farm Research Bureau; E. B. Norum, N. D. State College; and Emil Truog, U. of Wisc. 3. Russell Coleman, National Plant Food Institute, Washington, and Gene Van Deren, Bluegrass Plant Foods, Cynthiana, Ky. 4. William B. Porterfield, National Potash Co., New York, and Jeff D. Stewart, Jr., Federal Chemical Co., Louisville. 5. G. L. McGuffey, Sohio Chemical Co., Lima; Floyd L. Lucas and J. R. Sargent, Federal Chemical Co., Louisville. 6. G. C. Matthiesen, Nitrogen Div. Allied Chemical & Dye, New York; Jack Portz, Wilson & Geo. Meyer, Chicago; Tom Meylor, Crest Chemical Co., Watertown, S. D.; and Charles E. Trunkey, Middle West Soil Improvement Committee, Chicago. 7. Bob Fitzgerald, Smith-Douglass, Inc., Streator, Ill., and Thomas E. Camp, Jr., Southwest Potash Corp., New York. 8. W. T. Corl, Darling & Co., Chicago; Floyd Bowen of Bonnie, Fla., and Bob Linderman of Chicago, both with International Minerals & Chemical Corp. 9. Walter Sackett, A. J. Sackett & Sons Co., Baltimore, and W. W. Whitlock, Illinois Farm Supply Co., Chicago. 10. E. E. Crouse, CDK Liquid Fertilizer Corp., Liberty, Ind.; Robert Ellsworth, Converse Liquid Fertilizer Corp., Converse, Ind.; and William Rutan, Agricultural Supply Co. 11. H. E. Wood, Farmers Fertilizer Co., Columbus, and Ralph Boynton, U. S. Potash Co., New York. 12. J. A. Hart, Spencer Chemical Co.; Harry T. Allan, Allerton Fertilizer Co., Allerton, Ill.; and Jim Hoffman, Spencer Chemical Co. 13. A. L. Bowers, Swift & Co., Chicago; Leonard Schrader and Ernie Herrbach, Standard Oil Co., Chicago. 14. R. P. Koos, Kenosha, and Bill Morgan, Hydrocarbon Products, New York. 15. John D. Zigler, International Minerals & Chemical Corp., Chicago; S. C. Smith, Darling & Co., Chicago; and George H. Kingsbury, Kingsbury & Co., Indianapolis.

available phosphate and three of potash by means of broadcast applications of these nutrients.

Row applications of phosphate and of potash have been made at several rates on each soil test level. The row applications have been applied to corn and wheat in a four-year rotation of corn-soybeans-wheat-hay.

Best yield results with soybeans have come from broadcasting most of the phosphate and using only small row applications.

Row applications of potash are effective in increasing corn yields and also the percentage of potash in the corn leaf. Since potash is relatively inexpensive, says Dr. Barber, it may be more economical as well as a safeguard against salt injury, to apply at least a part of it broadcast.

The practice of applying most of the fertilizer broadcast and using small amounts in the row will probably not make much modification in the types and ratios of fertilizer applied, he stated. In the beginning, the balance of phosphate to potash application will have to be adjusted to bring into line the available phosphate and potash in the soil. Subsequent maintenance applications will be determined largely by the crops to be grown.

The preferable time to broadcast phosphate and potash fertilizer in the rotation, said Dr. Barber, could be to plow it down for corn. It could be combined with the nitrogen application made at that time. Small amounts of fertilizer containing nitrogen, phosphate and potash; nitrogen and phosphate; or phosphate alone would be applied in the row, usually for corn and always for wheat.

**Mumm**

Nine out of 10 farmers work their land too much before putting seed in the soil, declared Walter J. Mumm, agronomist of the Crow's Hybrid Corn Co.

"Too much tillage with heavy machinery," said Mr. Mumm, "packs down the soil instead of opening it up. It plugs soil pores, breaks down desirable structure, slows drainage and aeration and makes it difficult for roots to penetrate."

This can result in lower yields of corn, wheat and other crops, he said, before describing the minimum tillage program he directs on the 1,800-acre seed farms at Milford, Ill. This program includes the application of up to 1,000 pounds of fertilizer per acre and the return of shredded corn stalks to the soil.

"We put back nutrients the crops take out, in order to keep up the fertility level of the soil," he said. Topsoil is loose and mellow to a 12-inch depth. Corn yields average 100 to 125 bushels per acre with this minimum tillage, high fertility program.

The plant food is applied in the fall on chopped stalks or straw. It is worked with a heavy field cultivator set as deep as 10 to 12 inches. Then in the spring the tillage program includes a once-over operation with a field cultivator followed by a smoothing implement.

The 12-inch top soil soaks up a lot of moisture, Mr. Mumm reported. Soil tilled in this manner absorbed 4 inches of rainfall without any runoff, whereas soils across the fence had runoff with only one inch of rain.

The minimum tillage, soil-building system is so effective in controlling runoff that all the grass waterways on the seed farms have been put into crop. The land is relatively level, he pointed out, but sod waterways formerly were an essential prevention against erosion.

The well-conditioned topsoil promotes a good contact between the seed and the soil. Good drainage and aeration, plenty of moisture and nutrients easily available to the soil all help build top yields, he added.

**Davis**

A "scalped" field, stripped of its topsoil, produced 75 to 80 bushels of corn per acre, when good soil management methods including fertilizer were used in 4-year tests, reported Dr. J. F. Davis of Michigan State University, who summarized results of these tests in a report presented at the meeting.

Corn yields averaged only 25 bushels per acre before the soil-building program was begun on the scalped field, he said, but "the renovation job was accomplished by a corn, oats, alfalfa, alfalfa rotation, or with a green manuring and a stable manure program."

Adequate amounts of fertilizer were used, according to Dr. Davis. Lime was not needed because the field contained considerable lime in its subsoil.

His report summarized Michigan soil fertility research in 11 different areas of investigation.

Farmers could save $3 to $7 per acre in labor, fuel and machinery costs by making minimum tillage part of their crop production management program, Dr. Davis reported. Minimum tillage involves "once-over" seedbed operation by pulling a rotary hoe, plow packer, easy tiller or some other smoothing implement behind the plow. To insure top success with minimum tillage, a good job of plowing should be done and the crop planted the same day as the soil is tilled.

**Woodruff**

Heavy applications of phosphate fertilizer can be profitable over a period of years on meadow crops on soil that has sufficient nitrogen and potash, C. M. Woodruff, University of Missouri agronomist, reported in summarizing results of 7-year Missouri experiments.

In greenhouse tests, he said, 20 percent superphosphate was added to provide 20, 40, 80, 160, 320, 640 and 1,280 pounds of $P_2O_5$ per acre on soil that was originally very deficient in phosphorus. The soil was limed, and nitrogen, and potash fertilizer were applied too at rates to provide 100 pounds each of nitrogen and $K_2O$.

A test crop of clover was reseeded twice during the 7-year period. Additional nitrogen and potash were applied at the original 100-pound per acre rates whenever hunger signs for these nutrients appeared in the growing clover.

Mr. Woodruff estimated that over the 7-year period, red clover yields from the soil getting phosphate at the rate of 1,280 pounds per acre were 10 times greater than on unfertilized soil. They were more than three times higher than the yields from soil getting the 160-pound phosphate application; more than double the yield from the 320-pound application and about 28 per cent higher than from soil getting phosphate at a rate equivalent to 640-pounds per acre.

With phosphate worth 8 cents a pound and hay at $10 per ton, an investment of $89.60 in 1,280 pounds of phosphate would give a net return of $385.60 for the 7-year period, or an average of $55.10 per year. An investment of $12.80 in 160 pounds of phosphate would give a net return of $107.10 over the 7-year period, or $15.30 per year.

At the end of the 7-year test the red clover hay had removed as much or more phosphate from the soil than had been supplied in the fertilizer applications of 160 pounds or less.

Mr. Woodruff emphasized that meadow crops require large amounts of phosphate in the soil to maintain satisfactory production over a period of years. He indicated that in Missouri a basic application of 500 to

600 pounds of superphosphate per acre is required to establish suitable levels of phosphate on soils deficient in this nutrient.

Over a long rotation, on a soil properly fertilized at the start, he concluded an annual replacement application of from 25 to 50 pounds of phosphate per acre per year is needed to maintain a satisfactory phosphate level in the soils.

**Albrecht**

A big market for fertilizer lies in using plant food to grow higher quality protein feed for livestock, Dr. William A. Albrecht, head of the soils department of the University of Missouri, told the agronomists and industry representatives.

Improvement in the feed's protein quality due to soil treatments, he said, depends in considerable measure on the crop on which the fertilizer is used. Dr. Albrecht cited the difference between red clover and timothy hay in feed value and protein quality, as indicated by Missouri tests.

"Red clover in a rotation on well-fertilized soil," he said, "converted nitrogen into crude protein for much higher feed values than did well-fertilized hay in which nitrogen applications were part of the soil treatments. In timothy, the fertilizer treatments did not contribute as much to the protein quality as they did for the red clover hay."

Various soil treatments can make significant differences in the feed value of the proteins in red clover, he said. This was shown in the wide variation in weight gains of rabbits fed timothy hay from plots receiving different soil treatments.

Weight gains were 700 per cent higher in a four-week feeding period from red clover grown on well-fertilized plots than on those that had received lesser treatments. These top gains came from plots in a four-year rotation that were given magnesium limestone, crop residues and fertilizer according to soil test suggestions, following earlier treatments of lime and nitrogen, phosphate and potash fertilizer, he said. The red clover giving the low feed value, came from plots in a three-year rotation that had a soil treatment of manure and supplemental nitrogen.

Dr. Albrecht reported that analyses of the red clover's chemical composition suggest that the various steps in the soil treatment were all essential contributors to the higher feeding value in the red clover for growing weanling rabbits.

"In terms of these analyses," he concluded, "there is the suggestion that while fertilizing for higher feed values will extend the market for fertilizer far beyond the area of using fertilizers for increased crop yields in bulk only, it will be also a tremendous challenge to learn how we can fertilize the soil to grow increased protein quality."

**Ohlrogge**

"Band fertilization at corn planting time is essential in getting the crop off to a good start in the spring" was the message of Dr. A. J. Ohlrogge, Purdue University agronomist, who said that broadcast and plow-down applications of plant food can build up the soil's general fertility level, but it takes starter fertilizer in the band to spur the corn plant's early growth.

Band fertilization, he explained, involves putting the plant food in a continuous single band approximately 2 inches to the side of the seed and at seed level or about one to two inches below the seed. This fertilizer placement method does its most effective crop-feeding job in the "seedling" or formative period from germination to the knee high stage.

Dr. Ohlrogge said that this period is probably "the most important in the corn plant's life cycle," since in this period there is a partial development of all the leaves, the root system, auxiliary buds, nodes, inter-


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nodes and primordial tassels the corn plant will ever have.

The first requirement for effective use of band-applied fertilizer is that it must feed the roots, so the root system can "proliferate" or develop the maximum number of additional shoots and branches in the band of plant food, he said. While nitrogen and phosphate are the most important nutrient elements in the starter fertilizer, supplemental potash is needed on many soils to feed the young corn plant.

"This can be accomplished," he continued, "by broadcast and plow-down applications of potash mixed into the plow layer, or by including potash in the row fertilizer."

Best results in nutrient "uptake" by the corn plant, he reported, can be obtained by putting the nitrogen and phosphate together in the band. Placing them in separate bands on either side of the seed cuts down the plant nutrient uptake by the corn.

In Indiana tests on two different types of soil, when nitrogen and phosphate were teamed together in the same band, the corn plant utilized upwards of twice as much phosphate as when these nutrients were placed in separate bands.

Dr. Ohlrogge said that one further possibility for band fertilization may lie in adding phosphate with nitrogen as a side-dressing once the corn is up. This, he said, might be a clue to even more nitrogen use.

**Garman**

"Proper placement of fertilizer can help Midwestern farmers solve the problem of costly germination injury to corn crops," was the statement of Dr. W. H. Garman, of Washington, chief agronomist for National Plant Food Institute.

He said that germination injury to corn has become so extensive in the past two years and that widespread attention has been focussed on the matter of fertilizer placement.

Two factors are holding back widespread adoption by farmers of proper placement methods, according to Dr. Garman: **1.** Lack of proper equipment of farms for placing fertilizer in bands at a safe distance from the seed; **2.** Lack of definite recommendations for placing fertilizer by all of the Midwestern colleges. Only four Midwestern states have specific published recommendations for the band placement of starter fertilizer.

His statement was based on a recent survey among Midwestern agricultural colleges conducted by the National Joint Committee on Fertilizer Application.

Another cause of germination failures in corn, he said, is that present day tractors travel much faster than the speeds for which planters and fertilizer attachments were made. As a result, skips in planting as well as cracking of the seed occur.

In addition, present day split-boot applicators place the fertilizer in with the seed, or even above it, when the tractor pulls at too high speed.

"Michigan studies indicate that for every mile in excess of three per hour a tractor is driven, the number of germinating corn plants is reduced by 800 to 1,000 per acre," he said. Germination failures can be caused, too, by the amount of soluble salts in fertilizer. Since 1949 in the Middle West, the amount of nitrogen and potash in mixed fertilizer has nearly doubled.

Dr. Garman emphasized that proper fertilizer placement can promote top efficiency in crop production and help farmers meet the present cost-price squeeze.

As a result of the survey, Midwestern colleges, he continued, are unanimous in recommending that: "Starter fertilizer for corn be placed in a continuous single band approximately 2 inches to the side of the seed and from seed level to 2 inches below seed."

An intensive educational program will be required to get the proper fertilizer application equipment into the hands of all farmers who need it, he said, adding that "The fertilizer industry stands ready to participate in this program in cooperation with the colleges and the farm machinery industry.

"First, farmers must be told that good applicator equipment is on the market," Dr. Garman pointed out. "Very few of them know this today.

"Second, the farm machinery industry must strive to sell the proper type of equipment and cooperate with the colleges in discouraging the

*(Continued on page 65)*

**State Agronomists' Suggested Minimum Fertilizer Grade Needs of the Middle West for the Year Beginning July 1, 1957***

| RATIO | ILL. | IND. | IOWA | KANS. | KY. | MICH. | MINN. | MO. | NEBR. | N.D. | OHIO | S.D. | WISC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0:1:3 | 0-10-30 | 0-10-30 | 0-10-30 | | | 0-10-30 | 0-10-30 | 0-10-30 | | | 0-10-30 | | 0-10-30 |
| 0:1:2 | 0-10-20 | 0-10-20 | | | 0-10-20 | 0-10-20 | | | | | | | |
| 0:1:1 | 0-20-20 | 0-20-20 | 0-20-20 | 0-20-20 | 0-20-20 | 0-20-20 | 0-20-20 | 0-20-20 | | | 0-20-20 | | 0-20-20 |
| 0:2:1 | 0-20-10 | 0-20-10 | 0-20-10 | | 0-16- 8 | 0-20-10 | 0-20-10 | | | 0-20-10 | 0-20-10 | | 0-20-10 |
| 1:6:3 | | | | | | 4-24-12 | | 4-24-12 | | 4-24-12 | | | |
| 1:4:4 | 4-16-16 | 4-16-16 | 5-20-20 | 5-20-20 | 3-12-12 | 4-16-16 | 5-20-20 | 5-20-20 | 5-20-20 | | 4-16-16 | | 5-20-20 |
| 1:4:2 | 5-20-10 | 5-20-10 | 5-20-10 | | | 5-20-10 | 5-20-10 | | | | 4-16- 8 | | 5-20-10 |
| 1:3:9 | 3- 9-27 | 3- 9-27 | | | | 3- 9-27 | | 3- 9-27 | | | | | 3- 9-27 |
| 1:3:6 | | 3- 9-18 | | | | | | | | | 3- 9-18 | | |
| 1:3:2 | | | | | 4-12- 8 | | | | | | | | |
| 1:3:1 | | | | | | | | 8-24- 8 | | | | | |
| 1:2:4 | | | 5-10-20 | | | 5-10-20 | 5-10-20 | | | | | | 5-10-20 |
| 1:2:3 | | 5-10-15 | | | 5-10-15 | | | | | | 5-10-15 | | |
| 1:2:2 | | 8-16-16 | 8-16-16 | | 5-10-10 | 8-16-16 | 8-16-16 | 8-16-16 | | | 6-12-12 | | 8-16-16 |
| 1:2:1 | | | 10-20-10 | 10-20-10 | | 10-20-10 | 10-20-10 | 12-24-12 | 10-20-10 | 10-20-10 | | 10-20-10 | |
| 1:1:3 | | | | | 6- 6-18 | | | | | | | | |
| 1:1:1 | 10-10-10 | 10-10-10 | 10-10-10 | 10-10-10 | 10-10-10 | 10:10:10 | 10-10-10 | 10-10-10 | | 10-10-10 | 10-10-10 | | 10-10-10 |
| 1:8:0 | | 5-40- 0 | | | | | | | | | | | |
| 1:4:0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | | 8-32- 0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | 8-32- 0 | |
| 1:2:0 | 10-20- 0 | | 10-20- 0 | | 10-20- 0 | 10-20- 0 | 10-20- 0 | 10-20- 0 | 10-20- 0 | 10-20- 0 | | 10-20- 0 | |
| 1:1:0 | 15-15- 0 | | 15-15- 0 | 15-15- 0 | | | 15-15- 0 | | 15-15- 0 | 15-15- 0 | | 15-15- 0 | |
| 2:1:2 | | | | | | 20-10-20 | | | | | | | |
| 2:1:1 | | 14- 7- 7 | | | | 12- 6- 6 | | | | | 14- 7- 7 | | |
| 2:2:1 | | | | | | 12-12- 6 | | | | 12-12- 6 | | | |

*The production of higher grades of the suggested ratios is encouraged. Solutions of similar ratios are acceptable.

The following changes in grades and ratios have been suggested for future consideration: 1-3-6 (3-9-18) to 1-2-4 (5-10-20); 0-1-3 (0-10-30) to 0-1-4 (0-10-40); 1-3-9 (3-9-27) to 1-2-8 (4-8-32); 1-2-3 (5-10-15) to 1-2-4 (5-10-20).

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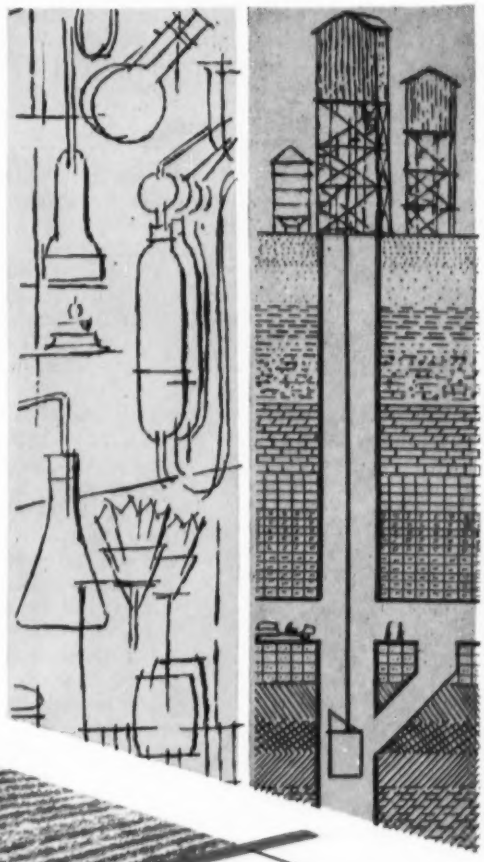

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# Priddy's New Granulation Plant Ready to Meet First Seasonal Peak

**Additional Facility, Equipped by Renneburg, Boosts Production Capacity for 60-year-old Firm**

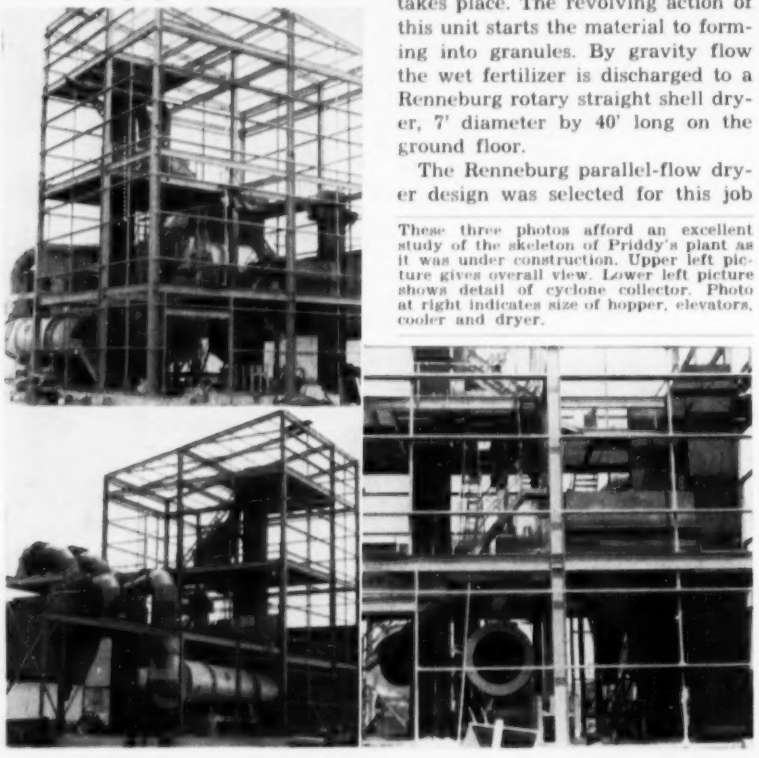
The Charles W. Priddy & Co., Inc. plant is located in the Money Point area in South Norfolk, Va. It was designed to produce 20 tons per hour of granular fertilizer and since the plant started up last July 31, it has made several thousand tons of granular fertilizer including the following grades: 5-10-10, 10-10-10, 8-0-24, 10-20-10, 10-20-20 and 14-14-14. A large part of the company's output is still in the form of pulverized mixed fertilizer so that it is prepared to furnish both types to its customers. Sydnor Y. Priddy is president of the 60-year-old firm. Other officials are A. L. Ridgwell, vice president; J. S. Hand, vice president; I. F. Womble, secretary; J. C. Green, treasurer; T. A. Branch, plant manager; C. D. Dunn, assistant superintendent; and H. D. Mann, office manager.

In the new Priddy granulation plant all dry base materials are premixed in a surge hopper from which it is weighed and conveyed to a Renneburg combination ammoniator-granulator where the ammoniating medium, acids, and water are mixed with the superphosphates and potash. The underlying principle of the ammoniator at the Priddy plant is based upon the proper introduction of the ammoniating medium, and the acid, as required, into the bed of dry material.

A submerging manifold is designed for admitting ammonia solutions or anhydrous ammonia, under and along the length of the bed of rolling material. A second header is designed for introducing sulphuric acid or phosphoric acid into the ammoniating section, just under the top of the cascading bed of the solid material. Each liquid is individually controlled.

The ammoniated wet fertilizer continually spills over a deep bulkhead into the conditioning and granulating section of the unit. Here a high percentage of moisture removal takes place. The revolving action of this unit starts the material to forming into granules. By gravity flow the wet fertilizer is discharged to a Renneburg rotary straight shell dryer, 7' diameter by 40' long on the ground floor.

The Renneburg parallel-flow dryer design was selected for this job and is the most contributing factor in shaping and "rolling-up" of the small uniform pellets. The moisture content of the product is easily lowered to less than 2% at dryer discharge, where it is transferred to a Renneburg counter-flow rotary straight shell cooler, 7 ft. in diameter by 30 ft. long, located parallel with dryer on the ground floor. In this unit the temperature of the granules is lowered to a safe storage temperature of 100 degrees F. to 120 degrees F. on most all grades produced.



These three photos afford an excellent study of the skeleton of Priddy's plant as it was under construction. Upper left picture gives overall view. Lower left picture shows detail of cyclone collector. Photo at right indicates size of hopper, elevators, cooler and dryer.

After cooling, the product is carried via bucket elevator to the classification stage of the process. A two-surface vibrating screen sizes the product with a 6 x 20 mesh cut delivered to storage.

Oversize is carried to a hammer mill for cracking, drying and rescreening. Fines are returned to the ammoniator for granulation along with the base material feed. Dust losses from the dryer and cooler are minimized by collecting the fines in high-efficiency cyclones and returning them to the ammoniator-granulator.

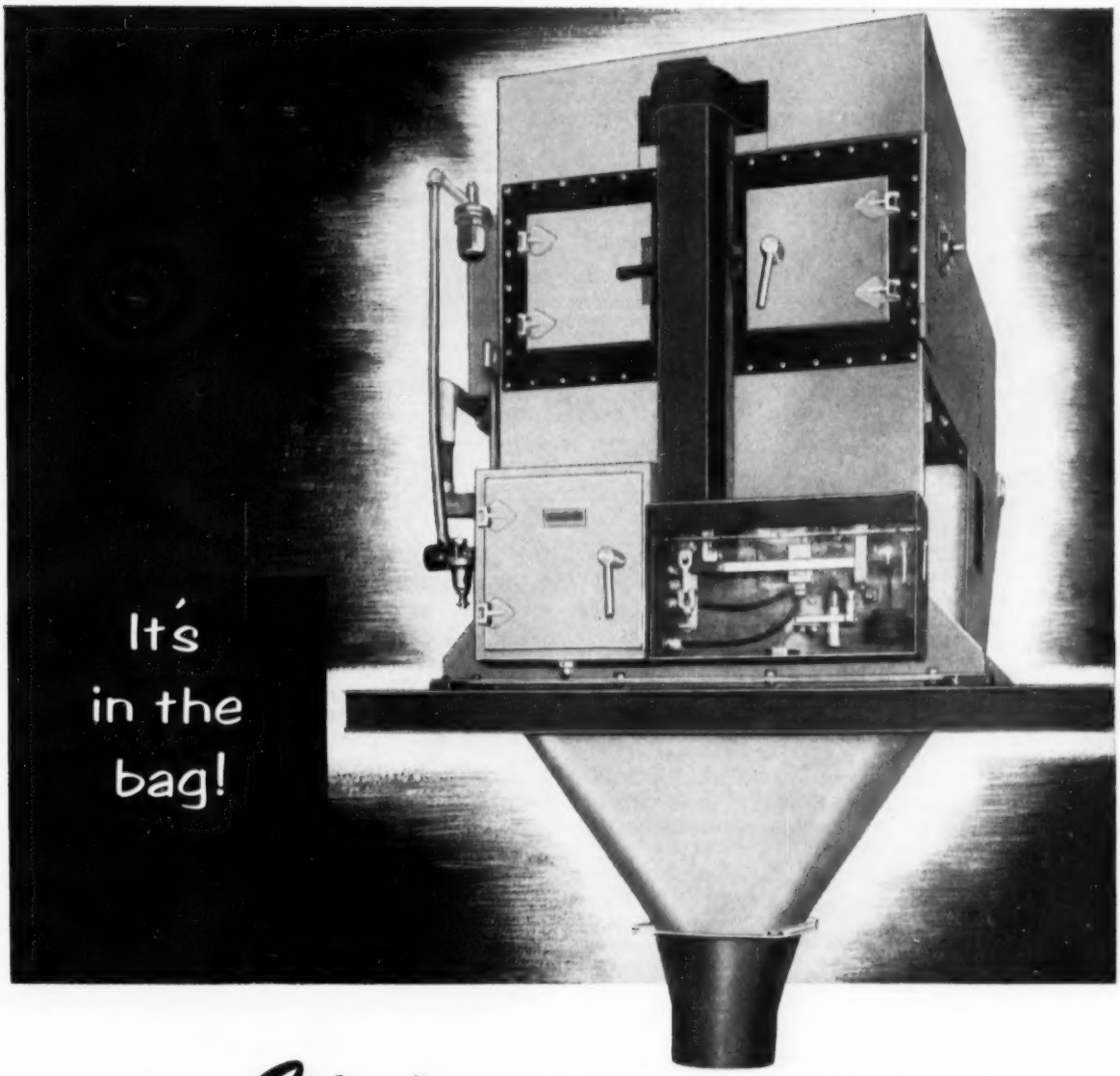
The entire plant operation is controlled from the operating floor adjacent to the combination ammoniator-granulator.

## British Agriculture Society Invites Visitors to Show

The Royal Agricultural Society of England extends an invitation to all oversea agriculturalists and manufacturers and distributors of agricultural machinery, equipment, and supplies to attend the Royal Agricultural Show to be held at Costessey, County of Norfolk, July 2-5, 1957.

Oversea visitors are asked to inform the Secretary of the Society, 35 Belgrave Square, London, S.W.1, of an address in the United Kingdom to which the Society may forward, toward the end of June, guest tickets providing free admission during the 4 days of the show.

The show grounds are about 5 miles west of Norwich, which is 120 miles from London and is served by rail and road from all parts of the country. Convenient bus service is available from Norwich to the grounds at Costessey.

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## ARIZONA

**Inland Fertilizer,** Phoenix, has completed its new 7600 square foot office building which cost $42,000. The concern was founded in Los Angeles in 1918 by the late **Grover Danford** whose widow now is president.

## CALIFORNIA

**American Potash & Chemical** have opened the $200,000 addition to their Whittier research laboratory, which doubles previous working space, and accommodates the staff of 65, now under the administration of **Dr. William Emerson.** The original lab was opened 3 years ago.

* * *

Farmers Cooperative Association is planned by a group of San Joaquin Valley farmers and cotton gin operators, headed by **John Squire** of Stratford. They contemplate a $16,000,000 plant capable of 300 daily tons of ammonia fertilizer, which would be located somewhere in the Valley.

* * *

**Ammonia Chemical Corporation,** also in the Valley, is building a $5,000,000 anhydrous ammonia facility three miles west of Huron. It is the joint venture with **Monterey Oil** associated. J. H. Finney, is president.

## CONNECTICUT

**Hubbard-Hall Chemical's** headquarters are at Waterbury, not South Deerfield, as we stated in January, in reporting the merger of the four New England fertilizer plants. Sales office is at Portland, with branches at South Deerfield, Mass., and North Haven.

* * *

**Fertl, Inc.,** South Norwalk, seems to be the first to offer fertilizer containing gibberellin. Theirs is a soluble combination, produced by **Imperial Chemical Industries.**

## ILLINOIS

**Marquiss Farm Supply,** Clinton, are adding to the storage in their liquid plant to bring it up to 192,000 gallons. Owner and manager is **Charles E. Marquiss;** sales manager, **Thomas Edwards;** office manager, **Fred O. Price.** In addition to the Clinton plant, they also have one in Hallsville.

## INDIANA

**Jasper County Farm Bureau Co-Op** is now under way with the construction of a new plant at Kersey in northern Jasper county. The new plant will offer both liquid and bulk fertilizer.

## KENTUCKY

**Federal Fertilizer** will lease a $30,000 warehouse now being built in Lexington, and will move from their present location.

## LOUISIANA

**Liquid Fertilizer Nitrogen and Equipment Company,** New Iberia, has been granted dissolution of charter.

## MARYLAND

**Fertilizer Manufacturing Cooperative** is one of a number of Baltimore concerns joining in protest against the City's new manufacturing tax.

## MINNESOTA

**International Minerals and Chemical Corporation's** new fertilizer plant, representing a unique departure in design and construction, went into production near Fairfax, February 18.

Officials said that it is the first fertilizer plant in the United States to be constructed entirely of precast concrete.

Exterior walls and interior bulkheads, made entirely of concrete are said to offer distinct advantages in material handling and provide for easy expansion of the plant to the south and east.

The single-story structure occupies a 100 x 140 foot area on a 40-acre site. It provides storage space capable of handling about 25,000 annual tons of fertilizer, and 4,000 square feet of manufacturing area. Freight handling facilities include a truck loading dock and a spur track.

Started last August, the plant was designed by the company's plant engineering section with the Chicago engineering consulting firm of **Verne E. Alden Co.**

**E. P. Ruszat,** who has had nearly 20 years of service with IMC, and formerly was plant superintendent at Mason City, will operate the Fairfax plant.

* * *

**Minnesota Peat Cellulose & Chemical Corp.,** Chiholm, have asked a grant of $184,000 for construction of a plant to manufacture humus extract from peat.

## MISSOURI

**Swift & Co's** plant in St. Joseph, which we reported in January as in production finally held its formal opening February 10, with tours for the public. The plant cost $1,000,000; it is operating on two shifts. **R. W. Finch** is general manager.

## MONTANA

**Midas Minerals** phosphate fertilizer manufacturing plant being constructed about 15 miles south of Drummond is expected to go into production during the summer.

The plant, being constructed at a cost placed at upward of $200,000, is at a large phosphate deposit south of Drummond. The firm plans to mine, mill and market.

The work is directed by **Theodore Miller** and **Alvin Wetzel,** who formed the company in association with **C. K. Shiro,** president of the firm, and **Douglas Campbell** and **Stanley Sorenson.**

## OHIO

**National Gypsum** has a permit to build in Lorain a $6,000,000 gypsum plant. Officials there, in doubt about the smoke and air pollution problem, were flown to the concern's New Jersey plant. Impressed by the job of control there, they issued the permit.

## SOUTH DAKOTA

**Crest Chemical** has opened its new fertilizer plant at Watertown, and will employ 30 at peak periods.

## WYOMING

**San Francisco Chemical,** Montpelier, Idaho, are progressing with their 1000 daily ton phosphate concentrator at Leefe. This is expected in production by mid-year, and will employ what **D. L. King** states is an "entirely new concept in dressing Western rock." He explains it this way: "For the first time, such rock will receive benefication based upon the selection and collection of the phosphorite particles in the pulp, rather than upon classification of the fine low grade from the coarse high grade." This should permit use of any grade heading as plant feed, he says.

## CANADA

**International Nickel and Texas Gulf Sulphur** are setting up a pilot oper-

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ation to extract elemental sulphur from sulphur dioxide at Sudbury, Ontario. The pilot plant will produce 10 daily tons, using dioxide from I-N's roasting there.

* * *

**Imperial Oil** has decided to build a $25,000,000 integrated petrochemical plant next to its refinery at Sarnia, Ontario, for completion early next year.

## BRAZIL

**Sociedade Industrial de Minerios e Acidos,** is building a plant at Santa Luzia to turn out 125 daily tons of sulphuric.

## GERMANY

**Fritz Hamm, GmbH,** is offering an industrial area of some 30,000 square meters on the Rhine near Krefeld to US manufacturers of chemicals or animal feed whole will establish there a subsidiary plant. Hamm, established in 1912, would act as European selling agents. If interested, write **Dr. H. E. Kerkhoff,** 246 Erkrather Strasse, Dusseldorf. A report on the Hamm concern is available from the US Dept. of Commerce.

* * *

**Kohle-Oel-Chemie AG** will build a $23,800,000 polyethylen plant near Gelsenkirchen. The concern is a joint operation by the Hamburg concern of **Deutche Erdoel,** Dusseldorf's **Mannesmann** and the Franmfuurt **Farbwerke Hoeschst.**

* * *

**Salzdetfurth Potash,** Hanover, has voted to increase its capitalization by 20,701,000 marks to finance new production installations, and for other purposes.

## JAPAN

**Asahi Chemical** will build a 50 daily ton ammonia plant at Noboeka. **Chemical Construction Corp.** are contractors.

## JORDAN

**Jordan Potash** is planning a pilot plant for refining potash from the Dead Sea, and invites bids based on the report prepared by the **Chemical Construction Corp.,** New York.

## MEXICO

**The Government's** $3,200,000 triple superphosphate plant at Coatzacoalcos, Veracruz, now in the blueprint stage, is to be on the line in 1958. It is slated to produce 150 daily tons.

This 20-ft. wide, high speed, spreader-seeder that quickly folds to less than 8 ft. in width for highway travel has just been announced by the E. S. Gandrud Company, Owatonna, Minnesota, manufacturer of Gandy Equipment. It will cover the same width of application as a truck spreader, yet eliminates not only compaction problems but can be used where a truck cannot be used. For complete information write E. S. Gandrud Company, Inc., Owatonna, Minnesota.

## PHILIPPINES

**Atlas Consolidated Mining and Development Corp.,** will build an acid and fertilizer plant at Toledo to supplement their copper mine and smelter. **Saint Gobain** will supply the equipment and install. Cost — about $1,600,000.

# CHANGES

**Olin Mathieson** is reported to have changes in the operation of two areas: The Arkansas district has been expanded to include Tennessee, in addition to Arkansas and Oklahoma. This, according to **Joseph Mullen, Jr.,** Little Rock, general manager of the plant food division there, is in line with the expansion of North Little Rock plant facilities, where recent installations have made the plant one of the most modern fertilizer and crop chemical mixing plants in the Southwest.

Operations of the North Central district have been consolidated in new headquarters at 800 South 72 Street, Omaha, according to word from district manager **S. Y. Roth.**

* * *

**Chemical Salt,** Tacoma, Washington, an affiliate of **Hooker** and **Pennsalt,** is expected to merge with **Stansbury Salt** of Salt Lake City, the combined name to be **Solar Salt Co.**

* * *

**Stauffer Chemical** has simplified its corporate structure by pulling two wholly owned subsidiaries into the parent corporation. They are **Nyotex Chemicals** and **New York-Ohio Chemical.**

* * *

**Re-Mark Chemical** has taken over the **Treamm Chemical Corp.,** North Miami, Florida, according to president **David Marks. William C. Webb,** Tremm president, has relinquished his holdings due to the press of other business. Re-Mark has expanded fast in its 12-year history. Three months ago they bought a fertilizer plant in Goulds, and prior to that spent $100,000 on a sulphur mill in Belle Glade, expanded their Hallendale nitrogen plant to include aqua-ammonia facilities. Recently they formed a distribution subsidiary in Cuba.

**American Machine & Foundry** has completed acquistion of **J. B. Beaird Company,** Shreveport, Louisiana, a manufacturer of liquid petroleum distribution systems and other equipment for the chemical industries. They have also acquired **Voit Rubber,** Los Angeles producers of rubber equipment, according to **Morehead Patterson,** AMF board chairman and president. Beaird has three plants; Voit has four; they will operate under AMF's General Products Group.

* * *

**Dorr-Oliver** Incorporated has announced plans for major expansion and re-allocation of its United States production facilities and a further expansion of Dorr-Oliver-Long Ltd.'s plant at Orillia, Ontario.

This involves centralization of all domestic filter manufacture at the already expanding Hazleton, Pennsylvania plant. The plan also calls for conversion of the Oakland, California plant to a semi-production type facility where such units as pumps, centrifugals, DorrClones and D-Sanders will be manufactured using semi-mass production methods.

The plan for the Orillia, Ontario plant is an extension of an expansion program begun early in 1956. This plan, also involving new equipment in addition to expansion of existing facilities, is scheduled for completion this year.

* * *

**Standard Oil Company** has acquired all outstanding common stock of **Schrock Bros. Co.** fertilizer firm at Congerville, Illinois, **Dwight F. Benton,** Standard Oil sales vice president, has announced.

The company will continue in business as a Standard Oil affiliate principally for the sale of anhydrous ammonia in Illinois, Indiana, Iowa, Nebraska and Kansas.

**W. O. Brazier,** former assistant sales manager for Standard Oil at South Bend, Ind., was elected president and a director of the company. **J. B. Schrock,** who is a member of the board of directors, will continue to be active in company operations.

# "Even *wet* they're strong...

and burlap is easy to grasp," says Harlan Jackson, Montgomery, Ala. farmer. "I always order my fertilizer in burlap bags. I can sell the empties or use them around the farm. We can't afford costly delays and spillage because of torn containers—that's why we always use burlap bags. They're strong—they won't burst—and we can handle them as roughly as we want."

This farmer likes fertilizer in burlap bags that are easy to grasp and don't tear. How about your own handling and spillage problems? *What bag is strong even when wet?*

## *Just ask your own customers—*

***they'll tell you that burlap***

**Is strong** — takes dragging, dropping, *man-handling* — any tough job on the farm.

**Gives good ventilation** — keeps farm supplies and products fresh.

**Laughs at sudden showers** — wetness or dampness can't weaken it.

**Saves money** — extra value from re-sale and re-use.

**Saves storage space** — stacks to any height without slipping.

**Has 1000 uses** — always in demand on the farm (popular with farm wives, too!)

**THE BURLAP COUNCIL**

*of the Indian Jute Mills Association*

155 East 44th Street, New York 17, N. Y.

# Personals

**Mahlon K. Hassell, Cooperative Fertilizer Service,** South Norfolk, Virginia, has been appointed by the City Council to the South Norfolk Port and Industrial Commission.

* * *

**Dr. Oscar W. Nestor,** personnel supervisor Pressware plant **Corning Glass Works,** has been named personnel director of **Virginia-Carolina Chemical Corp.**

* * *

**Eugene Cecil, Cooperative Fertilizer,** Winchester, Kentucky, has been elected president of the Tri-City Management Club.

* * *

**John G. Reed, Jr.,** and **Robert D. Gorham, Jr.,** have joined **Planters Oil & Fertilizer,** Rocky Mount, North Carolina, respectively as director of organization planning and public relations.

* * *

**W. R. "Buster" Hancock,** general manager of **Superior Fertilizer and Chemical,** Tampa, Florida, has been named Florida's Man of the Year by **Progressive Farmer** magazine for his work as president of the **Florida Agricultural Council** and on many other agricultural groups, being chairman of many of them.

* * *

**Harry N. Althouse** has resigned from the **Pennsylvania State Grange,** to be associated with **Reading Bone Fertilizer,** Reading, Pennsylvania.

* * *

**Commercial Solvents** has elected **Monroe C. Gutman** as a director, it was announced by **J. Albert Woods,** president. Mr. Gutman is a partner in Lehman Brothers, investment bankers, and chairman of the executive committee of The Lehman Corporation, an investment company.

**Walter A. Bauer** has been named manager of Commercial Solvents' St. Louis industrial chemicals sales district. His appointment heads a list of personnel changes and additions which have been announced by **Frank E. Maple,** general manager of Commercial Solvents' Industrial Chemicals Department.

Mr. Bauer will direct sales operations in an area which includes Southern Illinois, Missouri, Arkansas, Oklahoma, Kansas, Nebraska, and Colorado. Other sales representative appointments announced by Mr. Maple include the assignment of **Anthony J. DiNardo** to the company's Cleveland office; **Lee C. Holscher,** formerly with **Eastman Kodak Company,** to the Cincinnati office; and **William C. Danielson** to the Chicago district.

Denton

**Spencer Chemical Company** has announced the election of five new vice presidents and the assignment of new responsibilities for its principal officers.

**J. C. Denton,** formerly general works manager, was elected vice president — agricultural chemicals and will be in charge of an integrated product division responsible for the production and sale of the company's agricultural chemical products.

**H. R. Dinges,** formerly general manager of industrial chemical sales, was elected vice president—industrial chemicals and will be in charge of an integrated product division responsible for the industrial chemical and commercial product segments of the company's business.

**Frank Pyle,** formerly works manager of the company's polyethylene plant at Orange, Texas, was elected vice president—plastics and will head up the company's plastic division including production, sales and product development in the polyethylene and nylon fields.

**Dr. John R. Brown, Jr.,** formerly managing director of research and development, was elected vice president—research and development.

**E. V. Friedrich,** formerly assistant to the president, was elected vice president—administration.

**C. Y. Thomas, John P. Miller,** and **Joe E. Culpepper,** all of whom have been vice presidents and directors of the company for several years, will be primarily concerned with divisional coordination at a policy level and long range planning for future growth.

In making the announcement **Kenneth A. Spencer,** president of the company, said, "I feel confident that these changes will contribute to the continued growth and development of the company."

* * *

**William J. C. Leslie** has joined the sales division of **Werthan Bag Corporation** and will make his headquarters at the company's general offices at Nashville, Tennessee. His previous position was a manager of sales and advertising for Godchaux Sugars, Inc., New Orleans, La.

* * *

**H. L. Herkelrath** has resigned for reasons of health as manager of the **Stauffer Chemical** Vernon, California plant. He has been replaced by **John B. Gay,** since 1924 superintendent of their Portland, Oregon,

Appointment of three technical specialists in the field was recently announced by the Du Pont's Polychemicals Department. They are Ove F. Jensen, left, for the Midwestern states, John Spicer, Jr., center, for the Southeastern states, and Dr. Philip B. Turner for the Northeastern states.

**POTASH RAISES FARM INCOME.** The successful American corn farmer. He talks rotations and experimental stations. He talks potash, too. It's not all talk, either, because every September he comes up with the best harvest around. So it must be true, what he says about using potash-enriched fertilizers in his soil—that they fight diseases and help increase his yield. He works no harder than the next farmer. The prices he gets are a little fancier, that's all.

**USP's Higrade muriate of potash is free-flowing and non-caking and has the highest $K_2O$ content—62/63% $K_2O$. Also available, USP's Granular muriate of potash contains a minimum of 60% $K_2O$.**

**UNITED STATES POTASH COMPANY**
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REG. U. S. PAT. OFF.

Tom L. Jones has been appointed director of multiwall sales for Arkell and Smiths, according to announcement by S. Y. Carnes, vice president and general sales manager.

plant. Mr. Gay has been with them since 1927. As superintendent at Portland, Stauffer has appointed **Charles F. McMackin. William Arnold Sikkel** has joined Stauffer as salesman in Michigan, western Ohio and northern Indiana for the agricultural division.

* * *

**Chester B. McCord** as manager of manufacturing and **Asa S. Morgan** as assistant have been announced by **A. A. Scholl,** manager of the **International Paper** bagpak division. Both will be headquartered at Camden, Arkansas. To replace Mr. Morgan, **J. A. Horne** has been made superintendent of the Mobile plant.

* * *

**Fulton Bag & Cotton Mills** has announced these personnel changes: **Eugene B. DuBois,** general manager bag division, elected vice-president; vice-president **E. Monroe Hornsby** becomes manager, mid-states branch; **T. R. Moorer** becomes sales manager of the newly combined Atlanta and Savannah territories; **Kenneth H. Kerr,** formerly assistant there, now heads the Denver branch; **T. Raymond Berry** heads the Atlanta bag plant; **George W. Williams** manages the Dallas plant.

Two of these appointments replace retirements: **Henry W. Meyerhoff,** Kansas City branch, a veteran of 53 years with Fulton; **Eugene Revelle,** Denver, 40 years with Fulton. Both will continue to accept special sales assignments for the company.

* * *

**E. R. Bailey,** manager of the San Francisco plant of the **Bemis Bro. Bag Company,** whose retirement has been announced by Judson Bemis, executive vice-president, has completed 52 years of service to the company.

An assistant sales manager and two additional sales representatives have been appointed by National Potash Company, it was announced by William B. Porterfield, Jr., vice president and sales manager. Sydney H. Rogers, left, was named assistant sales manager. For the past three years he was manager of out-of-town sales for Spring Mills, Inc., New York. Robert L. Harper, center, will represent the company in the territory west of Chicago under the direction of Cash J. Cahill. James A. Hunter will cover the northeastern territory of the U.S. and Quebec out of the company's New York headquarters.

**Lee R. Hays** has been appointed to represent **The Texas Company** in the mid-west in selling Texaco anhydrous ammonia and nitrogen solutions for agriculutral use, it has been announced by **S. C. Bartlett,** the company's vice president in charge of sales.

Mr. Hays joined The Texas Company after eleven years in the field of agriculture first with the Pennsylvania Railroad and then with **Olin Mathieson.**

* * *

**L. J. Polite, Jr.,** has been promoted to product sales manager of the chlorinated products division of **Diamond Alkali,** Cleveland, Ohio, it was announced by **Loren P. Scoville,** general manager of the division. Sales manager for certain major Diamond organic chemicals during the past year, Mr. Polite will now hold overall sales responsibility for the complete, diversified line of chlorinated products manufactured by the company.

* * *

**D. S. Parham** has become responsible for all production activities of **The American Agricultural Chemical Company,** exclusive of the Phosphate Rock Mines, as general superintendent of production. The new responsibility includes supervision of chemical and elemental phosphorus production in addition to fertilizer production.

**Du Bois** **Hornsby** **Moorer**

**Kerr** **Berry** **Williams**

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# DAVISON'S TRIPLE

## Superphosphate

State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's New Triple Superphosphate in your formulation.

Davison's Triple Superphosphate has 45/46% available $P_2O_5$ and is supplied in the easy-to-use granulated form or run-of-pile.

Order Davison's Triple Superphosphate. For complete information, call or write.

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J. Walter Harding, elected secretary of Federal Chemical, Louisville, Ky., to succeed F. H. Courtenay, who resigned to go with Carrier Conveyor. Not shown is R. McKay Shehan, elected treasurer to succeed the late W. Quinn Harned.

Robert J. Stevens who has been named mid Western district manager of the Raymond Bag Corporation, a division of Albermarle Paper. He assumed his duties Jan. 6, 1957.

**W. H. Phillips,** formerly of the company's Detroit, Mich. sales office, has accepted responsibility as assistant manager of the Cincinnati, Ohio sales office.

* * *

**Dr. J. A. Almquist** has retired as assistant general manager of **Du Pont's** polychemicals department. This resulted in a series of three high-level management changes in the company February 1:

**Walter H. Salzenberg,** assistant general manager of the Grasselli chemicals department, succeeded Dr. Almquist in the polychemicals department.

**Dr. Wallace E. Gordon,** director of Du Pont's advertising department, succeeded Mr. Salzenberg in the Grasselli department.

**Frederic A. C. Wardenburg,** director of sales for the pigments department, became director of the advertising department.

* * *

**Dr. Zay Jeffries,** noted metals scientist and retired vice president of the **General Electric Company,** has been re-elected chairman of the board of trustees of **Battelle Institute,** Columbus, Ohio.

Dr. Joseph D. Campbell who has been appointed agronomist for the north central district of the plant food division, Olin Mathieson Chemical Corporation. Dr. Campbell joined Olin Mathieson in 1953.

**Vernon Bishop,** president, announces the appointment of **Robert B. Troxel** as sales manager of the Lebanon Chemical Corporation, Labanon, Pa.

* * *

**Dr. Kenneth A. Arnold,** technical director of the **St. Regis Paper** central technical department, has been transferred to the New York office. Dr. Arnold was previously located in Deferiet, New York, where the department will continue its research and development work.

* * *

**Vincent L. Rebak,** New York district sales manager for **Grace Chemical Company,** a division of W. R. Grace & Co., has been inducted as the 1957 president of the Salesmen's Association of the American Chemical Industry.

* * *

**The Blaw-Knox Company** announces the appointment of **W. Earl Dunn** as vice president and general manager of The Chemical Plants Division.

## OBITUARIES

**Francis T. Blissert,** 73, founder of Blissert Burlap Bag, died January 4 at a hospital in Long Island, New York.

**William B. Gery,** 60, Dorr-Oliver Co. technical director, died January 1 at a Norwalk, Connecticut hospital.

**George Franklin Hubbard,** 80, former Armour Fertilizer agent, died instantly when struck by an automobile in Fayetteville, North Carolina, December 15.

**Byron A. McKinney,** 74, retired auditor for Royster, died in a South Boston, Virginia, hospital January 19.

**Henry deLeon Southerland,** 77, retired industrialist who had been connected with Virginia-Carolina and had managed the Jefferson Fertilizer Co., died January 23 after a short illness.

## OREGON

(*Continued from page 23*)

ing that, "Banks feel a farmer improves his credit rating as he improves his yields." He complimented fertilizer dealers for the fine educational job they have done among bankers in showing the need and results of farm chemicals.

Production loans, according to Low, will be adequate during the current year for farm financing. Delving into the loan situation, Low stated that the general lowering of farm income has been responsible for doubling of production loans since 1947, but that the increased use of farm machinery and chemicals have been major contributors to the increased demand.

Another speaker before the retailers was Palmer Torvend, Washington county agent, who reported excellent results on the Pacific Northwest Plant Food association sponsored experimental demonstration farm near Hillsboro, Ore.

Directed by Tom Jackson, soils department head, Oregon State college, the program featured talks by O. C. Compton and L. A. Alban of the soils department staff and F. Todd Tremblay, fertilizer manager, Washington Cooperative association, Seattle.

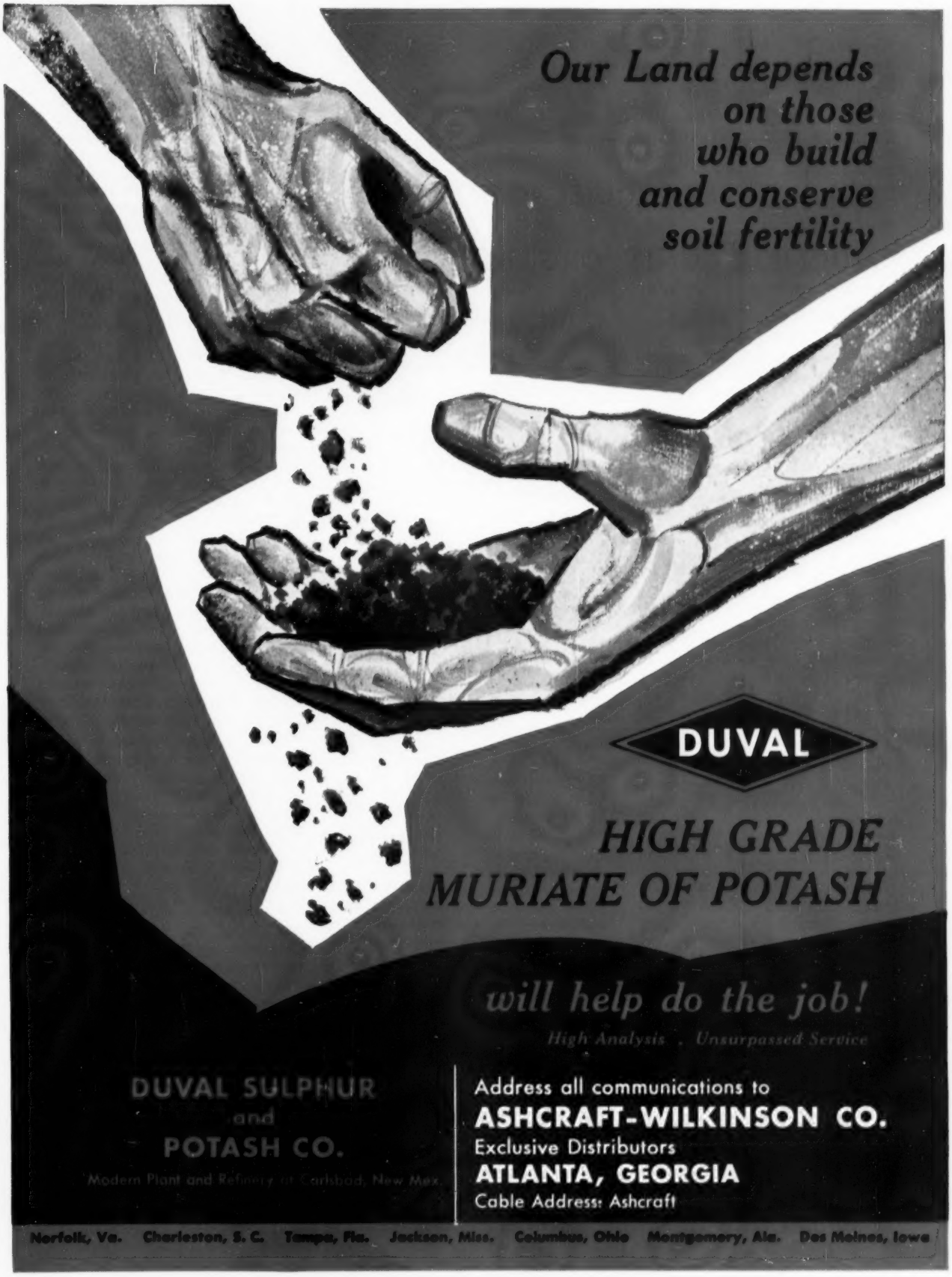
## Idaho Dealers to Hear Experts

Pacific Northwest Plant Food Association's successful program of flying squad speakers will enter Idaho beginning February 27 for a six city tour of fertilizer presentations for dealers, farmers and county agents.

Announcement of the Idaho invasion was made January 21 by executive secretary Leon S. Jackson. First day program will be held at Coeur d'Alene and be followed by a meeting Friday, February 28, in Lewiston; Tuesday, March 5, at Caldwell; Wednesday, March 6, at Twin Falls; Thursday, March 7, at Pocatello and the final meeting will be held in Rexburg on Friday, March 8.

Each city will hear an identical program which will open at 9 a.m. and continue through 4 p.m.

Speakers will include Roger Harder, G. O. Baker, and Charles G. Painter, University of Idaho; Robert Reichert, director of plant industry, Idaho State Department of Agriculture; John Siddoway, project supervisor, ARS; and Dr. Marshall J. LeBaron, superintendent, branch experiment station, Twin Falls, Idaho. Additional members of the trade will be on hand to participate in a panel discussion which will end the educational conference.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# SAFETY....

By J. Lauren Shopen, *Safety Director*
*Consumers Cooperative Association*
*Kansas City, Missouri*

## THE SAFETY DIRECTOR IN A MULTIPLE - UNIT ORGANIZATION

### Management and Employe Support

Accident and fire prevention must be an integral part of operations if the program of accident and fire control is to be successful. Top management support, and, in fact, management support at all levels, is also vitally necessary if the program is to succeed. Last, but not least, is the enthusiastic support of employes in a safety program.

As suggested by the title, methods used to attain these objectives will provide the major theme of our discussion.

Those responsible for administration of a safety program over far-flung areas with many different locations, face some problems which perhaps do not exist in an operation where the unit is, so to speak, under one roof. In effect, the application of such a program means that its basic purpose is to so organize, develop and maintain the safety program in order that the results may be satisfactory to all parties concerned.

### Protective Equipment and Training

Whatever the case, the qualifying items mentioned in the beginning of my comments are a must in any safety program. It is obvious that the usual component parts of a safety program, including proper protective equipment and training of workers, are mandatory if the program is to be successful.

Comments here, however, will be more generally along the lines of the over-all safety program as it might apply to separated units away from the headquarters of any given organization.

Under these circumstances, it is important that the items referred to be implemented by other methods in order to assure success in the fields of accident and fire prevention.

### Organization

To give a picture of how such a program might be operated, we break down some of the procedures used by our organization.

### Physical Examination

Beginning with the physical examination prior to employment, it has been our experience that a good physical examination is a must to start on the right track to accident prevention.

We are proud of our physical examination form as it has been very carefully developed over a period of years. We feel that it embodies the necessary key checks to weed out a worker who is obviously unfit for the type of work a fertilizer plant requires.

Our form has one side for completion by the employe and the other side by the examining physician. The employe is required to fill out the health history portion of the form in his own handwriting prior to his physical examination.

This form makes the relatively routine request for health history information from the prospective employe. Oftentimes this history is taken by the examining physician.

However, we feel it is better to get this information direct from the employe. In this way we can focus his attention on safety and health matters at a period when he has more time for reflection. This paper work on his part makes him conscious of the stress which we place on accident prevention.

Our Health History also calls for information as to whether or not the employe has been rejected for insurance. This is important, as sometimes the employe can pass an industrial physical examination even though he may have some serious physical deficiency not discernible on a routine physical examination.

To cite a particular example, one man was hired and passed the physical examination. When the Health History report was completed, we found that he had a metal plate in his back and was obviously unsuitable for the rugged work of the type encountered in a fertilizer plant.

We are also interested as to whether or not the individual has drawn disability compensation. Requests for this information are carried on the form. If the answer is "yes" we want to know: From whom? For what? When? and How long? We think this is particularly important and that the importance of the data is self explanatory.

We attempt to place stress on the value of avoidance of accidents within the organization by asking a question on the form as to whether or not the individual has had any serious accident. If so we ask that the accident be described. We believe that this focuses the prospective employe's attention on the subject of accident prevention even before he is on the payroll.

We are also concerned as to whether or not the individual has any health complaint. Does he have any skin allergies? How is his hearing? Does he have ulcers? These and other points are important in our analysis of the individual qualifications for employment as related to accident prevention.

At the bottom of the Health History form, the employe signs a statement to the effect that his statements are true. He understands that continued employment is based on the truth of his statements written on his health and accident history.

### Health

We are concerned in our screening of employes using this type of approach to handle any health items such as epilepsy which the employe may not willingly admit. As an example, we feel that there are jobs where a person with epilepsy could be employed, but we do not feel that a fertilizer plant falls within that category.

Given at National Safety Congress Fertilizer Section Oct. 22, 1956.

### Orientation

After the employe has been hired, it is then the responsibility of the plant superintendent or his assistant to break-in the employe. We feel that orientation of a new employe is most important. He must understand the danger spots within the plant and must have a thorough knowledge of the safety equipment to be used. Perhaps equally as important, he must have the feeling that he "belongs."

### Records

A good record system is of paramount importance in determining progress in accident prevention. Such records do not need to be elaborate, but at the same time they must be complete.

We make a master file jacket for every doctor's case resulting from an industrial injury. By so doing, all accidents fall into one place.

Our jackets require the following information: The date of each accident, the classification (in other words, was it a fatal accident, permanent partial, permanent total, temporary total or non-disabling).

We also want to know the accident cause. We require the compensation and medical cost paid as a part of the file.

The jacket file also shows the part of the body affected in the accident. Thus we have quick reference to rather complete data in any referrals to an accident case. We require the superintendent to fill out or have completed by the appropriate foreman a detailed accident report following the accident. We want to know who, why, when, where and how.

We require that each field point complete a monthly report. This gives us the total number of manhours worked, the number of accident cases and lists any fires which have occurred.

Access to this information enables us to be in possession of complete data and, where necessary, take remedial action to correct the condition.

### Safety Meetings

Safety committee meetings are held on a monthly basis. We use a prescribed safety meeting form which gets very specific as to accomplishments. For instance, we ask how many recommendations were made by the committee. We want to know how many recommendations were completed. We want the committee to list the number of doctor's cases resulting from on-the-job injuries. We want them to ask why the accidents occurred. We feel it is of key importance to make sure that something happens when safety committees meet, insofar as accomplishment.

Shopen

We recognize safety committee performance by furnishing those who served at the conclusion of the period a framed certificate. This is signed by the top men in the organization and given to the committee members for framing. This is tangible evidence of management interest in the program.

We encourage our safety committees to get out into the plant and make inspections so that unsafe conditions existing may be corrected.

We furnish 35 mm film strips and 16 mm movies for safety committee meetings. A complete list is given to the chairman from which he can order.

### First Aid

First aid supplies are maintained in the plant. Emergency numbers of the physician, ambulance and other key numbers are placed at strategic locations throughout the plants.

### Awards

Employes are given, at the end of an accident-free year, a card showing the number of months and years worked without a lost time accident. The card is signed by the president of the organization and by the safety director.

Supervisory performance is recognized by a similar card but tailored to supervisory requirements.

In addition, we give employes and supervisors some type of award for perfect calendar-year records with no lost time injuries. These items are not expensive, but we find that they are most helpful in developing employe interest. Items given range from billfolds to automatic pencils suitably inscribed to recognize the period safely worked.

We try to recognize the plants when they have worked a full year with no lost time by having a safety achievement dinner. We arrange to have an excellent meal and a particular safety program tailored to the employes' needs at the time of the dinner. In our opinion, recognition of a good record is the most practical and desirable way of continuing a good record. We feel that supervisors and employes who do an outstanding job should be recognized.

### Morale

When operations are scattered, one of the greatest problems is to make the employe feel that he is part of the organization. I think we would all be in agreement with the statement that good morale is as important to accident prevention as it is to production or sales.

When management loses touch with the employe because of his far-flung location, a morale problem may very definitely be encountered. Lack of morale may take several forms. Oftentimes it is shown in reduced production due to lack of interest, and again it rears its head as general discontent within the employe group. Another common form for lack of morale to follow is an increased accident trend.

In order to combat this feeling, we have used from time to time a tape recorder. With the tape recorder, we can take our top management directly to the scene of operations and can, if we so desire, use the employes' names in the conversation. In addition, information pertaining to safe methods of operation can be disseminated to all groups of employes.

We have followed this practice and feel it has been most productive. In order to make such a plan successful, it is necessary that a script be written as it is important to give cohesion to such a program. Otherwise, it loses its punch.

Another item of interest which we have used is the matter of writing up newspaper accounts of accidents which did not happen, but which we tried to dramatize by showing what could happen.

### Accident Repeaters

In order to keep our supervisory management informed as to accident repeaters, we also send to them at periodic intervals a list of doctors cases occurring to various employes. We feel that when an employe has been to the physician because of an industrial injury three times or more, unless corrective ac-

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tion is instituted, a serious accident will occur.

As a case in point, one of our employes had 10 injuries, 8 of which were eye injuries, over a period of time. When we started this program and the supervisor received the list of excessive injuries, he immediately talked with the employe about the accidents. He was successful in eliminating or greatly reducing injuries to the employe. The obvious cause, of course, was lack of protective equipment. When the employe realized that his supervisor was conscious of his problem he began to protect his eyes.

**Bulletin Boards**

Bulletin boards play an important part in separate operations extending over several states. We maintain bulletin boards at all of our field points and send bulletins from the National Safety Council to the various facilities. Sometimes we prepare our own. These are sent to the outpoints once a week so that a fresh change of posters is available.

A bulletin board should not be overlooked as an excellent medium to push the cause of accident prevention. The posters must be changed frequently. In order to avoid duplication, posters are listed by number and there is a ninety-day waiting period before the posters are reused. Posters are also used by classification, depending on the type. Variations are used. Some may be on falls, others on chemicals and still others on traffic.

**Inspections**

Routine inspections are made by the Safety Department at periodic intervals. We discuss our recommendations with the superintendent and explain the reasons for all recommendations. We attempt to work **with** the supervisor, not against him. After all, the supervisor has the same basic objective as the Safety Department — increased production with the lowest possible number of accidents. Copies of the recommendation report go to the division manager and the local manager.

**Fire Drills**

We require our fertilizer operations to have fire drills once a month. This includes handling fire hose in order to establish necessary habit patterns so vital in case of emergencies. It includes responding to the scene with portable first aid fire equipment for all classes of fire.

Further than this, we encourage the City Fire Department to make regular inspections of our property and to tie in with us so we can have joint fire drills. A double purpose is accomplished when the City Fire Department participates. They become familiar with our facility and its hazards. Our employes become acquainted with fire department equipment and are acquainted with necessary action procedure at the time of emergency.

We require a monthly report requesting information pertaining to fires. We ask for a report of any fires which have occurred. This, we feel, is a very valuable report.

For instance, on such a monthly report a fire was listed from spontaneous ignition. The City Fire Department controlled the fire without any appreciable damage. The local manager, however, got behind on his production and failed to correct the condition that caused the fire. The report, then, was the factor which basically was responsible for correction of the condition. The correction came about, of course, in the normal routine of followup information as a result of the data developed on the form.

**Servicing of Fire Equipment**

We maintain a master list of fire extinguishers at all of our locations.

Extinguishers are broken down by classes. It is our intention to have suitable fire extinguishers for each facility, based on the type of fire we expect to have. Inasmuch as there is no universal fire extinguisher for all types of fires, we use appropriate types for Classes A, B and C fires.

We maintain monthly fire extinguisher servicing dates for all portable fire equipment. At appropriate times we send notices to the outpoint. We request that the equipment be serviced, properly tagged and our department notified.

Our experience has led us to the conclusion that unless this type of followup is made, equipment may not be ready at a time of emergency.

At periodic intervals we put on fire training sessions for our employes. We give them a chance to inspect, handle and discharge the equipment. No matter how good the equipment may be, it has no significance unless the employe understands it, has confidence in it, and knows how to use it.

**Shutdown Precautions**

Prior to the time of a holiday shutdown, we use what we call a pre-holiday shutdown bulletin. This has a check list of various fire precautions and is dramatized by a picture of a huge fire. On the sheet we list the holidays and call attention for particular care at such times. Among other items the check sheet calls for is a check of the entire plant before leaving. This includes equipment which may have been left on accidentally, rag clean-up, etc.

After the shutdown, if there have been no fires, we send congratulatory letters to the plant managers. In all such cases we see that their supervisors are aware of their good work performance.

**First Aid Training**

We encourage our employes at our field points to take first aid training and attempt to have someone assigned who can handle first aid at each facility. We feel that such training serves two purposes: First, it makes the employe conscious of the accident potential. Second, it gives him a correctly prescribed course of emergency action.

**Driver Testing**

We have begun a program of driver testing since we have a number of payloader operators. We test with a portable Porto-Clinic. With this unit we can test for visual acuity, color perception, field of vision, passing judgment and reaction time. Because of its portability, it is well suited for our scattered operations.

In addition, we use a Night Sight

## INDUSTRY CALENDAR

| Date | Organization | Place | City |
|---|---|---|---|
| Mar. 4-5 | Southern Safety | John Marshall | Richmond, Va. |
| Mar. 6-8 | NAC | Fairmont | San Francisco |
| June 9-12 | NPFI | The Greenbrier | White Sulphur Springs, W. Va. |
| June 17-19 | Sou. Control Officials | Dinkler-Tutwiler | Birmingham, Ala. |
| July 10-14 | Plant Food Producers of Eastern Canada | Manoir Richelieu | Murray Bay |
| July 18-19 | SW Fert. Conf. | Buccaneer Hotel | Galveston, Texas |
| Nov. 3-5 | CFA | St. Francis | San Francisco |

Meter. This unit measures the normal threshold of vision at night. It checks the reaction of the driver to glare and records recovery time after glare.

Not all of these factors are completely pertinent to fertilizer operations, but we feel it will give us a rather complete picture of the visual skills of the operators.

Our tests have shown that some drivers have very glaring driving weaknesses. Some, in fact, have been unable to read any of the letters on our eye test chart. Such conditions are usually easily compensated for by the use of corrective glasses.

Our purpose in using the equipment is to create a sense of awareness in the employe as to any visual weaknesses which he may have.

Having access to the equipment is valued by our employes as it enables them to have knowledge of conditions that might lead to an accident in which they might be seriously or fatally injured.

Many of the ideas which have been suggested might be called "remote control." In a sense, it provides control over separated operations from a headquarters operation.

Many of such procedures, however, might be adopted by a local operation.

In conclusion, we believe that if the component parts of the safety program, which consist of management and employe support, proper protective equipment and adequate training, can be synchronized, that a successful program of accident and fire control can be launched and carried through.

We have been fortunate in the respect that our management is enthused on the subject of accident and fire prevention. We feel particularly pleased because this type of enthusiasm extends from the top of the organization to the bottom employe supervisory level.

**Summary**

In the opinion of the speaker, there are few fields more important to the welfare of man than the field in which we are commonly engaged. Recognizing then that there is so much to be done for so many people, we should be more than zealous in our attack on accidents and fires. Continual progressive efforts will return rich dividends in lessened number of injuries and deaths to our associates and increased safe production.

## Crop Chemical Antidote Folder

A revised version of their handy, wallet size safety folder is being offered free by United Heckathorn, according to their executive vice-president, Ivor Burdeen. This includes a revised list of antidotes for the newer crop chemicals, such as Phosdrin, Thimet and Guthion. A new section concerns disposal of empty containers, and a list of latest approved safety equipment for handling of crop chemicals.

## Nitrogen Division Orange Plant's 3-Year Record

The Orange plant of Allied Chemical & Dye's Nitrogen Division wound up 1956 with a three year safety record unparalleled in Nitrogen Division's annals. It totalled 1,096 days and 867,714 man hours of continuous operation without a single lost-time injury. If the record can be maintained until May, the plant will be eligible for the Division's Plant Safety Award. Meanwhile individual safety prizes will be awarded "as a token of appreciation for their unfailing efforts to prevent injuries in the past 12 months."


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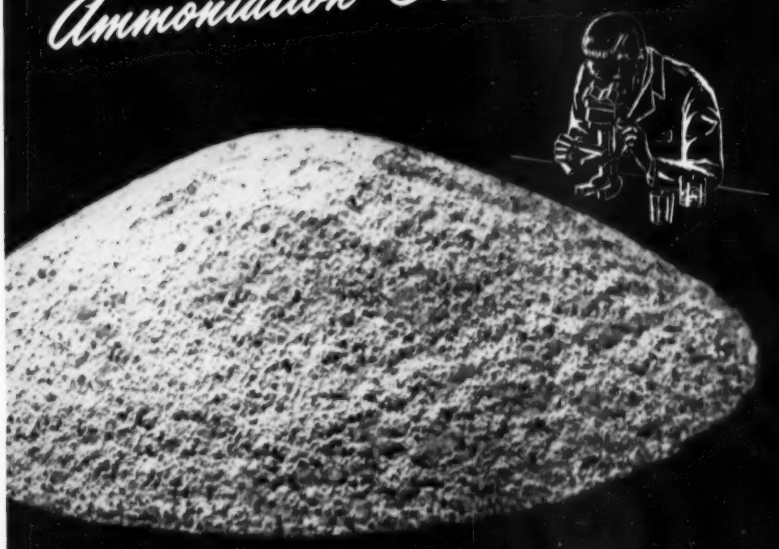

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# CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

| | January | | December | | Oct.-Dec. Qtr. | | July-Sept. Qtr. | | January-June | | YEAR (July-June) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STATE | 1957 | 1956 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1955-56 | 1954-55 |
| Alabama | ..... | 22,347[1] | 14,371 | 15,409 | 101,280 | 103,377 | 73,427 | 62,490 | 813,104 | 846,735 | 1,029,030 | 1,114,238 |
| Arkansas | ..... | 15,229[1] | 8,555 | 7,180 | 26,759 | 26,729 | 33,156 | 33,567 | 299,172 | 270,894 | 359,471 | 330,781 |
| Georgia | 33,574 | 41,187 | 49,063 | 64,682 | 168,751 | 170,229 | 84,808 | 80,739 | 993,954 | 1,047,875 | 1,244,422 | 1,273,445 |
| Kentucky | ..... | 55,413[1] | ..... | 14,838[1] | 51,948 | 58,090 | 38,271 | 33,388 | 441,481 | 431,024 | 529,600 | 522,410 |
| Louisiana | 10,761 | 12,716 | 8,295 | 7,415 | 46,979 | 36,496 | 24,150 | 22,849 | 214,343 | 232,781 | 273,688 | 310,848 |
| Missouri | ..... | 33,953[1] | 30,887 | 46,863 | 154,331 | 192,239 | 177,012 | 164,002 | 450,102 | 414,503 | 804,441 | 682,690 |
| N. Carolina | ..... | 86,554[1] | 43,325 | 53,152 | 148,970 | 163,008 | 67,264 | 62,174 | 1,424,267 | 1,566,158 | 1,649,449 | 1,830,633 |
| Oklahoma | ..... | 1,944[1] | 2,470 | 1,700 | 29,343 | 29,195 | 25,166 | 40,347 | 65,854 | 63,799 | 135,396 | 122,204 |
| S. Carolina | 39,286 | 41,629 | 23,216 | 24,259 | 79,910 | 78,592 | 43,019 | 41,355 | 743,670 | 796,111 | 863,617 | 928,715 |
| Tennessee | 6,492 | 3,399 | 8,298 | 6,267 | 107,591 | 95,140 | 58,203 | 59,120 | 378,676 | 355,966 | 515,551 | 523,349 |
| Texas | 34,255 | 27,459 | 31,736 | 28,740 | 130,969 | 117,563 | 71,436 | 76,141 | 377,805 | 375,176 | 566,399 | 588,062 |
| California | (reports compiled quarterly) | | | | ..... | 188,204[1] | 181,386 | 173,411 | 639,377 | 603,657 | 1,001,554 | 922,127 |
| Virginia | (reports compiled quarterly) | | | | 78,509 | 91,645 | 75,566 | 71,064 | 599,111 | 636,585 | 761,820 | 795,770 |
| Indiana | (reports compiled semi-annually) | | | | | | | | 807,918 | 873,966 | 1,063,049 | 1,158,960 |
| Iowa | (reports compiled semi-annually) | | | | | | | | 231,873[1] | ..... | ..... | ..... |
| N. Hampshire | (reports compiled semi-annually) | | | | | | | | 13,168[1] | ..... | ..... | ..... |
| Washington | (reports compiled semi-annually) | | | | | | | | 103,288 | 124,186 | 152,037 | 182,348 |
| TOTAL | 124,368 | 126,390 | 220,216 | 255,667 | 1,125,340 | 1,162,303 | 952,866 | 920,647 | 8,352,122 | 8,639,506 | 10,949,524 | 11,286,580 |

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

# MARKETS

**ORGANICS:** Prices for fertilizer organics continue steady with movement normal for this time of year. Leather Nitrogenous Tankage continues to be priced at $3.25 to $4.00 per unit of Ammonia f.o.b. production points.

Activated Sludge prices are unchanged at $2.95 per unit of Ammonia and 50c per unit of APA, bulk, f.o.b. at a Midwestern production point with another production in the Southwest priced at $3.00 per unit of Nitrogen and 50c per unit of APA, bulk.

**CASTOR POMACE:** Production of this material continues in drastically curtailed position. Contracts written for January and February shipment have not been shipped as yet by one of the major producers but some supplies are expected to move before the end of the month. Price is nominally $45.50 per ton, in bags, f.o.b. Northeastern shipping point.

**DRIED BLOOD:** The Chicago market for unground sacked Blood is around $6.00 to $6.25 per unit of Ammonia and the New York market around $4.75 nominal.

**POTASH:** Activity in this market continues normal with the movement from domestic sources in seasonal dimensions. Prices remain firm and unchanged.

**GROUND COTTON BUR ASH:** Movement of this source of Potash, primarily in the form of carbonate of Potash, continues steady. Current analyses are running about 38% to 40% $K_2O$ and delivered cost compares with Sulphate of Potash for most areas.

**SUPERPHOSPHATE:** Latest production figures of concentrated superphosphate indicate production somewhat behind that of the same period last season but prices continue steady and demand expanding. Normal superphosphate prices also continue steady and movement picking up.

**PHOSPHATE ROCK:** Market conditions remain relatively unchanged but, of course, effective February 23rd freight increase of 5% in Southern Freight Association territory will affect delivered cost to users in that area.

**NITRATE OF SODA:** No further change in prices has been noted since the change of January 1st. Demand is quite heavy in the Florida area and movement is expanding rapidly in the Southeast for direct application.

**CALCIUM AMMONIUM NITRATE:** Prices continue unchanged for this 20.5% Nitrogen which is priced at $44.00 per ton bulk and $48.00 per ton bagged f.o.b. Middle Atlantic production point and f.o.b. Atlantic and Gulf ports.

**GENERAL:** Due to heavy rains in some areas and extended lack of rain in other parts of the Southeast, movement of mixed fertilizer has been delayed for several weeks but is expected, in the next week or so, to get into heavier volume.


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**Doane research indicates**

# '57 Tonnage Up A Million

American farmers will buy one million more tons of fertilizer in 1957 than they did in 1956, according to a nationwide survey conducted by the Doane Agricultural Service, Inc., through its Countrywide Farm Panels, representing a cross-section of the nation's 2,100,000 full-time farm families.

Farmers plan to buy 4.7 percent more fertilizer this year than they did last year. A similar survey sent to these same panel members last year showed that fertilizer sales would be down 4.5 percent from 1955. Latest U.S.D.A. figures on fertilizer consumption show that the actual decline from July 1st, 1955 through June 30, 1956 was 4.41 percent. Other private estimates place the decrease for the calendar year 1956 at approximately 3 percent.

This survey also showed that 1.5 million farmers will use some type of agricultural chemicals in 1957. Seventy-nine percent of the panel members plan to use chemicals in 1957—a one percent increase over last year.

The Doane Countrywide Farm Panel is the nation's largest agricultural survey organization, containing a balanced cross-section of the nation's 2,100,000 full-time farm families having a gross annual farm income of $2,500 or more, and producing 87 percent of all farm products sold.

The questionnaires asking farmers to show their plans to purchase fertilizer and agricultural chemicals, as compared with last year, were mailed out January 28th. As of this date, the number of usable returns is 1,556 or 79%.

On a regional basis, the survey shows that the greatest increase in the use of fertilizer will be in the South Central Region, followed by the East North Central and the North Atlantic Region a decrease is expected to occur in the West North Central and Western Regions.

Plans to purchase fertilizer in 1957 as compared with 1956:

| | % Change |
|---|---|
| North Atlantic Region | + 7.9 |
| South Atlantic Region | + 3.8 |
| South Central Region | +14.7 |
| East North Central Region | + 8.9 |
| West North Central Region | — 4.3 |
| Western | — 9.8 |
| United States | + 4.7 |

The decline in potential fertilizer purchases in the West North Central and Western Regions reflects a combination of drouth conditions last year resulting in carry-over of fertilizer, as well as the effects of acreage control and the Soil Bank program.

Eighty-five percent of all panel members plan to buy one or more types of fertilizer in 1957. The types are as follows:

| Type of Fertilizer | Plan to Use in 1957 | Increase—1957 over 1956 |
|---|---|---|
| | Percent | Percent |
| Complete mixed fertilizer | | |
| Dry type | 77 | 1 |
| Liquid | 5 | 14 |
| Nitrogen Fertilizers | | |
| Anhydrous Ammonia | 13 | 8 |
| Liquid Nitrogen Solutions | 4 | 28 |
| Ammonium Nitrate | 31 | 2 |
| Other Nitrogen Fertilizers | 8 | Same |

While approximately 1.5 million farmers are expected to use some type of agricultural chemicals in 1957, the survey shows that many farmers will use only one or two types.

Chemicals for controlling insects on livestock will be the type most frequently used, according to the survey. Fifty-five percent indicated they planned to use them in 1957; forty-two percent indicated they planned to use post-emergence type weed sprays this year.

Thirty-six percent more of the farmers plan to use pre-emergence weed sprays and twenty-five percent more plan to use brush killers in 1957 as compared with last year.

The percent of farmers planning to use various types of chemicals in 1957, and the percent increase in users for each is as follows:

| Type of Chemical | Percent Planning to Use in 1957 | % Increase 1957 over 1956 |
|---|---|---|
| Pre-emergence weed sprays | 13 | 36 |
| Post-emergence weed sprays | 42 | 7 |
| Brush killer weed sprays | 21 | 25 |
| Insect Control, Crops | 41 | 3 |
| Insect Control on Livestock | 55 | Same |

A wide variation in the intended use of pre-emergence weed sprays was reported—ranging from a high of thirty-one percent in the North Atlantic Region to a low of five percent in the South Central Region. Increase in number of users was greatest in the East North Central Region.

Fifty-six percent of the farmers in the West North Central Region plan to use post-emergence weed sprays in 1957—a six percent increase over 1956. On the other hand, only fourteen percent plan to use this type in the South Atlantic Region—down five percent from 1956.

Farmers plan to increase their use of brush killers in all regions. Most frequent use is planned for the East North Central Region, but a sixty-one percent increase in the number of users is indicated for the South Atlantic Region.

The number of users of chemicals for control of crop insects will increase in all regions except the South Central Region where only fifty-nine percent of the number using chemicals in 1956 plan to use them in 1957.

The Doane Countrywide Farm Panels is comprised of a balanced cross-section of the nation's full-time farmers, based on the farm population and farm characteristics of each region. The panel includes proportionate regional representation for all of the 2,100,404 farms in the nation with gross farm income of $2,500 or more annually. Excluded from the panel are: farmers with sales of farm products of less than $2,500; residential farmers (those with annual sales of less than $250 worth of farm products); part-time farmers (those selling products valued at from $250 to $1,200 annually, whose operator spends more than 100 days in off-farm work or whose off-farm income exceeds the value of agricultural products sold); and institutional farms (those connected with a public or private institution). These four categories include 2,681,989 farms of which 1,679,298 are in the South Atlantic and South Central regions.

Doane Agricultural Service, Inc., was founded in 1919 as a pioneer farm management firm, and now is one of the nation's largest research, farm management and advisory firms, with activities extending into all phases of agricultural study and operation.

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# BLAW-KNOX

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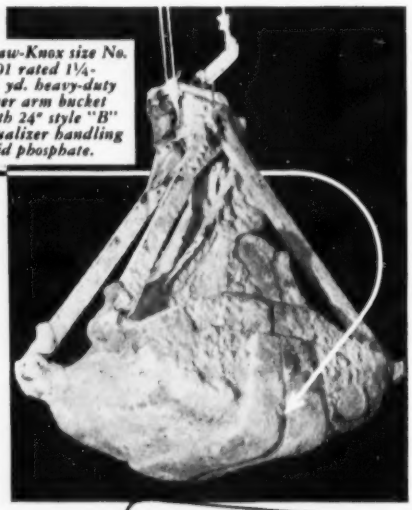

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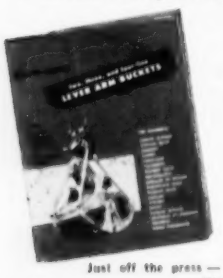

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**BLAW-KNOX FERTILIZER BUCKETS**

# Random NOTES & QUOTES

**Shrinking**—that's the position of agriculture—already in a minority position—in the opinion of Lloyd Halvorson, National Grange economist. What he means is, modern farm management methods have made it possible for fewer and fewer man-hours to feed more and more people. In 17 years the number of farm workers has shrunk from 10 million to 6½ million, operating on ⅔ of the farms.

So what he says is good from an economic point of view; but bad from a political angle. And that's exactly what he intended to say: "farmers must organize tighter," to quote the essence.

O

**Gresham's Law** needs looking into, according to the dean of the Louisiana College of Agriculture. In the case of the farmer it works in reverse. The law says "Bad money drives out good money." Dr. Efferson says "Good land drives out bad land" . . . and he also says "Good farmers drive out bad farmers."

This is proven by the fact that whenever the Government offers a bonus for restricted acreage, the farmers take the money and then find ways and means to grow more per acre on the land they have left.

To us this seems to prove that the old gag is right about the man who refused a subscription to a farm paper because "I ain't farming as good as I know how now."

O

**Fundamental** research is the bailiwick of a group named to advise USDA, and this 10-member committee—which among others includes NPFI's Russell Coleman—has asked for a broad and comprehensive research program on various phases of soils and water management.

O

**300 below** zero is used at the Calumet Nitrogen Products plant to make liquid air for use in the production of N.

O

**Tin cans,** bottles, garbage, paper, hedge clippings go into a fertilizer produced by the Organic Corp of America. We can understand the function of everything but the tin cans and the bottles. The paper in which we saw this said "fertilizer" was the product. Would someone in McKeesport please tell us more.

O

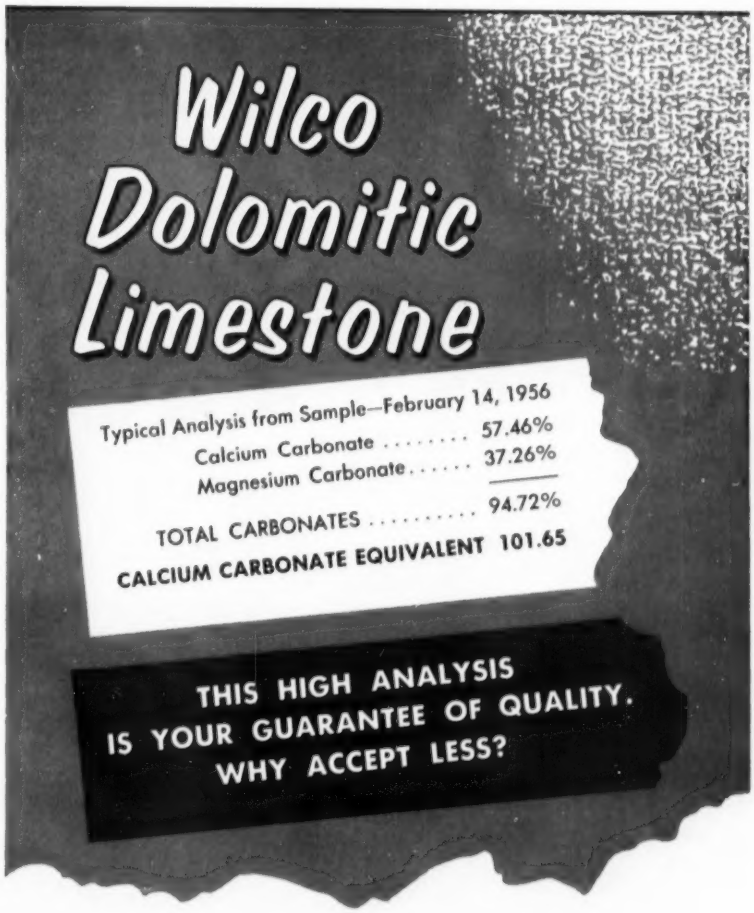
**Management** ratings of "Excellent" for 1956 have been won by three of our good friends, according to the American Institute of Management. They report American Agricultural Chemical; Swift & Co.; Consolidated Mining & Smelting.

O

**Secretary Benson** says conservation measures were carried out on 34% of the nation's farms in 1955, a nice fat increase from the previous year.

O

**Confidential** is the label on a delightful folder recently mailed out by Spencer Chemical, entitled "Jack and the Soil Bank" which has a bearing on the quote we were commenting on a few paragraphs back, from Dr. Efferson. The Spencer folder, marked, as we have said "Confidential; just for fertilizer dealers" talks about how Jack took the soil bank money, and his dealer was worried. But Jack bought more fer-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tilizer than ever . . . to get all the yield he could out of the surviving land.

O

**Bacteria** are about to help produce sulphuric acid, starting off with sewage sludge, if the pilot operation now going on in London works out. They say that if all the sludge in Britain were used thus they could produce 100,000 tons of annual sulphur. But nobody has mentioned the cost of bringing all that sewage into central plants.

O

**Stop** ruining your lawn . . . says a writer in San Antonio. He says too much N speeds disintegration of humus and causes spots attributed to all sorts of other lawn ailments. He reports Texas A&M approves an 8-8-4, which won't do this, and which is being sold down there as "Ferdile's Plantation Fertilizer."

O

**Nuts!** University of Wisconsin wildlife folks, having conducted research on oak trees, report that it doesn't help much to fertilize the trees to increase the acorn yield. This is important to the wildlife of the area, which is why the wildlife people moved over into the field of agronomy.

O

**Fire** in a field was extinguished by a clever farmer, who simply ran his tank-truck over the area and doused the fire with the insecticide it contained. We do not recommend this as standard practice until someone gives us the lowdown on how inflammable some sprays may be.

O

**Capper** Publications sent us a bulletin containing this very pertinent abstract, which seems to contradict some of what has been printed above. It says: "The total number of acres from which US crops are harvested has remained fairly constant since 1920, when there were 3¼ acres for each person in the US . . . in 1954 there were slightly over 2 acres for each person. That's not really contradictory. More people, fewer acres . . . everybody still eating.

And as Dr. Efferson says . . .

O

**Big Business,** that's what American farming is. Land and buildings on farms were 25% higher in 1954 as compared with 1949. This is also out of some Capper data, which shows that the land and building value of US farms is now $97,600,000,000 . . . or at least was that in 1954, which is the date of the recent USDA report.

O

**USDA** is sending Dr. Eliot Epstein to Maine to work with the Experiment Station on special soil management research. Dr. Epstein has been research man for Olin Mathieson and the Borden Company, primarily in fertilizers.

O

**Mites upset.** It seems from a report from the Connecticut AES that year after year spraying to control apple pests has upset the normal balance of insects, and thus has caused a rise in mite infestations.

O

**Armour Research Institute** has developed a soil builder out of waste material — from the pulp and paper industry. They report it loosens and improves moisture holding capacity of the soil; serves as a fertilizer base; controls the rate of plant absorption of the plant food.

Dr. C. Roland McCully headed up the project. Tests were moved out from the greenhouse to the field, and the new compound performed better than peat moss or commercial soil conditioner.

Triangle Brand Copper Sulphate has been recognized as an effective agricultural chemical for more than sixty years. In sprays (where Bordeaux mixtures are the most reliable), **in dusts (if you prefer them)** and in fertilizers (for additional enrichment of the soil) Triangle Brand Copper Sulphate has proved itself worthy and dependable. Try these Triangle Brand forms of Copper Sulphates:

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PICTURE OF THE YEAR

**Bagorama** *by P. Kent*

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1—In this discussion are Orville Helton, of the Southwest Virginia Cooperative, Bristol, Va.; Ed Morgan, of the Tennessee Valley Cooperatives, Inc., Decatur, Ala.; Dr. Leland G. Allbaugh, director of TVA's Division of Agricultural Relations; and Chester Venable, of Tennessee Farmers Cooperative, LaVergne, Tenn.
2—Visiting are Dr. Shelden L. Clement of TVA's Agricultural Relations Division; T. A. Stallworth, of Victor Chemical Co., Chester, S. C.; J. H. Hyder, of International Minerals, Greenville, Tenn.; and E. W. Liggett, manager of Bartlett and O'Brien Fertilizer Co., Owensboro, Ky.

# 40 FERTILIZER PEOPLE AT TVA EDUCATIONAL MEET

A total of 40 representatives of the fertilizer industry met January 29 and 30 in the Chemical Engineering Building, Wilson Dam, Ala., to discuss a fertilizer Distributor-TVA educational program.

The cooperative distributors in Tennessee Valley counties met January 29, while the industry group of fertilizer distributors met next day. They and TVA's soils and fertilizer and chemical engineering specialists discussed items of mutual interest, and planned for a more effective fertilizer demonstration program for the coming year.

The total demonstration program reaches farmers in parts of 35 states through fertilizer distributors and their dealers. The aim is to teach farmers how to do a more efficient job of fertilizing crops.

Program participants included extension agronomists Dr. Ralph L. Wehunt and Mr. P. J. Bergeaux of the University of Georgia, who described "The Georgia Fertilizer Educational Program." TVA participants included C. H. Young and T. P. Hignett, Office of Chemical Engineering, and Doctors Leland G. Allbaugh, S. L. Clement and George Stanford, and W. R. West, Division of Agriculture Relations.

Ray Sorenson was elected chairman of the industry group for the 1958 meeting, and Dr. Arthur Smith was chosen secretary. Sorenson is with Cornland Plant Foods, Grinnell, Iowa, and Dr. Smith is with Olin Mathieson Chemical Corp., Baltimore, Md.

For the cooperative group, Guy Sales of the Farmers Federation Cooperative, Asheville, N. C., was elected chairman. B. W. Edmonds, of the Valley Counties of Kentucky Cooperative, Murray, Ky., was elected secretary of that group.

## O-M Announces 8-32-16 Ammo-Phos

A new grade of Ammo-Phos pelletized fertilizer, 8-32-16, is being introduced to Midwest farmers this spring, it has been announced by G. A. Wakefield, director of sales of the Plant Food Division of Olin Mathieson Chemical Corporation. Providing 56 units of plant food per hundred pounds of fertilizer, it is one of the most concentrated complete fertilizers on the market.

## International to Build New Bagpak Plant

Construction work on a new multiwall paper shipping sack plant to be built by the Bagpak division, International Paper Company, in Litchfield, Illinois, will begin in early spring, it was announced by A. A. Scholl, division manager.

Mr. Scholl states that the plant will be located on a 20-acre site, will occupy 60,000 square feet and will employ approximately 200 men and women when it reaches full operation late in 1957.

The Bagpak Division presently operates shipping sack manufacturing plants at Camden, Arkansas; Bastrop, Louisiana and Mobile, Alabama. A fourth plant is being completed at San Jose, California.

## Potash Institute Posters to Teachers

American Potash Institute has mailed out a large 4-color poster for use in schools and county meetings, showing the effects of potash starvation on various crops, and explaining the remedy. It is part of the many educational aids the Institute supplies—teaching soil fertility by way of color motion pictures and slides, other wall posters and the monthly magazine "Better Crops with Plant Food."

## Dow Uses Radio For Meetings

An innovation in sales meetings has proved a big success for the agricultural chemical sales department of The Dow Chemical Company. The department recently employed a closed circuit broadcast over the American Broadcasting Company radio network to outline sales support to distributors.

The broadcast was heard by over a thousand distributors and their salesmen at 35 meetings in ABC-affiliated radio stations over the country. A district salesman chairmanned each local meeting.

Company officials described the program as the first time closed circuit radio has been employed in the agricultural chemical business.

Order Extra
YEAR BOOK
Copies Now
(See Page 58)

## Agronomist-Industry Meet

(Continued from page 38)

sale of the outmoded split-boot applicator."

In addition to corn, many problems have arisen in the fertilization of small grain, he reported. Some states do not recommend the necessary amount of plant food because poor crop stands will result.

"Until grain drills which will properly separate the fertilizer from the seed are in the hands of farmers in the Middle West," he concluded, "the colleges will continue recommending less than the required amounts of plant food.

"And until farmers have the proper type of equipment on hand, they will be operating below top efficiency."

### Hulburt

Recent work by National Joint Committee on Fertilizer Application's subcommittee on Machinery for Placement was described by Walter C. Hulburt, who is project leader for Fertilizer Distributing and Seed Placement Machinery Investigations in the Agricultural Engineering Research Branch of USDA's ARS. His report, in summary, was:

"Through the activities of one of the subcommittees of the National Joint Committee on Fertilizer Application, a library of color slides has been established of commercial machines for the application of fertilizer to soils and crops.

"The original library of color transparencies was set up some six or seven years ago, and duplicates of the slides were made available on a cost basis from the National Fertilizer Association.

"A catalog was prepared which gave a description of each machine listed. These catalogs were widely distributed and were used as a means of ordering duplicates, as well as giving pertinent information for the one using the slide or slides at any presentation or discussion group.

"One supplement was made to the catalog in 1951, and since then, practically no activity of the subcommittee was extended to keep it up to date with new machine additions. However, calls were made for duplicates of those listed in the catalog regardless of the fact that some of the models pictured had been discontinued.

"In 1956, a complete re-survey was conducted by the subcommittee, Machinery for Placement, and a new catalog will be issued shortly which will include most of the production line machines for the application of fertilizer. It might be well to explain the statement "most of . . . machines." There are some two hundred or more concerns manufacturing fertilizer application equipment.

"Of course, the majority of fertilizer machines on the farm are supplied by the first fifteen or twenty companies, when listed in order of size of companies. The 1956 survey received over 200 color slides from some thirty companies. Consequently, it is quite evident it cannot be said that the slide is complete, but the library definitely will have a high percentage of the models of fertilizer machines available for farm use.

"Another item should be noted—in 1950, eleven companies submitted slides and 89 were listed in the catalog. In 1956, over thirty companies responded and it appears that nearly twice the number of slides will be entered in the new catalog.

"It is felt that this increase of companies and machines indicates greater activity in this field. The new forms of fertilizer (as solutions and granulations) have had, no doubt, a bearing on the greater number of types of fertilizer machines now available to the farmers.

"The slides being shown (at the meeting) are a few of each group listed in the catalog. The machines are divided into the following groups: Broadcasters; Deep tillage; Plows; Planters; Drills (corn and cotton, potato, beet and bean); Transplanters; Sidedressers; Other liquid applicators: Dry chemical applicators.

"It is believed that the small interest in side placement equipment indicated by the farmer to the implement dealer has been to a large extent, because of lack of knowledge of such recommendations and available equipment. It is certain that extensive use of the new slides of corn planters with side placement equipment by extension workers will stimulate greatly the use of the new type applicators.

"The descriptions of the slides shown are given in the new catalog, and this catalog as well as duplicate slides may be obtained from the secretary of the National Joint Committee on Fertilizer Application. Dr. W. H. Garman is the secretary, and he is Chief Agronomist of National Plant Food Institute, 1700 "K" Street, N.W., Washington, D.C.

### Beers

Farmers in the Corn Belt are using three times more fertilizer today

(Concluded on page 68)


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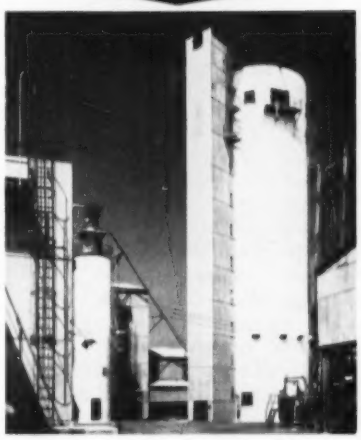

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On February 2nd, 1957 before a group of New England agronomists, Rhode Island University presented data which resolved one of the most controversial subjects since urea-forms were commercially introduced to the market a few years ago. Nitroform has always suggested the use of their urea-form in fertilizer formulas if the user were to obtain the highest benefit from his U-F applications. The benefits of single season applications would be greatly reduced if the potential user were forced to make applications of phosphate and potash following the nitrogen. Again it has been shown that various sources of nitrogen greatly improved the working qualities and nitrification characteristics of urea-form. Work conducted at Rhode Island University under the direction of Dr. Jesse DeFrance proves conclusively that urea-forms are both practical and desirable in fertilizer formulas.

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## Tree Farms in U.S. Show Acreage Gain

American Forest Products Industries reports the American tree farm system of growing timber as a crop on privately owned lands gained 3,709,310 acres in 1956, reaching a total of 41,548,217 acres in 44 states. Florida is first with 4,290,800 acres certified, followed by Georgia. Oregon is third with 3,667,778 acres, Washington seventh with 3,374,033 acres.

## Link-Belt Offers Two Useful Publications

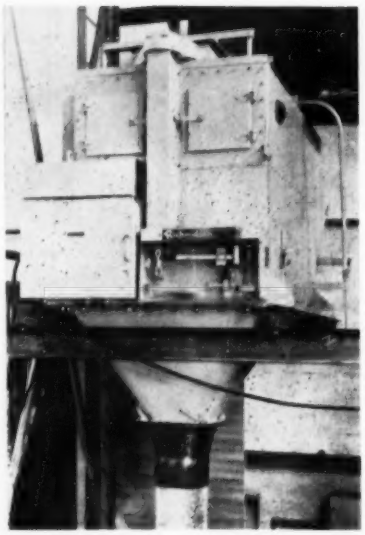
A new book, #2454 now being distributed by Link-Belt Company contains a complete presentation of their LXS bushed roller chain, plus application and selection data. They are also offering folder #2489 which describes new related ball bearing equipment, being added to their complete screw conveyor component line. For either or both of these, write to the Link Belt Company, Dept. PR, Prudential Plaza, Chicago, Ill.

## New Expansion Program For Continental Gin

Continental Gin Company, Birmingham, has inaugurated a multi-million dollar expansion program to broaden its diversification and provide additional facilities for a growing volume of business, it was announced last month by Eugene H. Brooks, executive vice president.

The broad program, which will require several years to complete, encompasses improvements to all of the company's facilities in Birmingham, Dallas, Prattville, Atlanta and Memphis. Major capital expenditures will be made at the company's plant in Birmingham which eventually will be utilized by the company's Industrial division. It produces both materials handling equipment under the Continental name and many types of custom-made machinery, machine tools and other high quality precision machinery for industry in general.

Scheduled for immediate construction at Birmingham is a new three-story wing addition to the general office building with 15,325 square feet of floor space. It will be similar in design and construction to the existing structure and will house additional engineering and office personnel.



This scale had passed a million test weighings when it was photographed, without a single mechanical or electrical failure, and no adjustments. It is the new HA-39 fertilizer scale by Richardson Scale Co., Clifton, N. J., who will be glad to tell you more.

Other improvement planned for the Birmingham property include: installation in the machine shop of new grinders, boring mills, horizontal boring bars and many special tools to expand production capacity.

Fabricating shop enlargements and improvements, including extension of heavy crane runways, building additions and new presses and tools to supplement existing facilities.

Improvements in the company's other plants will embrace substantial additions to office space and facilities at the Dallas and Memphis properties, and construction of and equipment for several new buildings for the manufacture and warehousing of gin machinery at Prattville, Ala. Construction work on the latter has already commenced.

In a statement announcing the expansion program, Mr. Brooks said: "Our company's broad expansion program has been necessitated by the very large and accelerating increase in our company's volume of business. Last year sales of Continental products were the largest in our company's 125-year history. The incoming rate of new business in our Industrial Division is substantially ahead of any other year."

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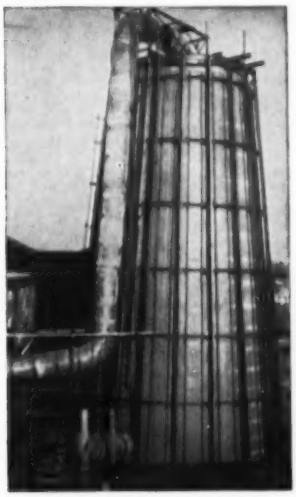

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## Agronomist—Industry Meet

*(Continued from page 65)*

than they did at the end of World War II, Zenas H. Beers, executive secretary of MWSIC reported. "Not only are more pounds of fertilizer going onto more acres of corn and small grains, but each pound of fertilizer contains more nutrients. This trend has heightened the need for accurate placement of fertilizer."

He said that complaints of injury of germinating seedlings of corn and small grains due to poor fertilizer placement have been increasingly frequent in recent years. Much of the placement equipment now in use on Corn Belt farms was not designed for today's fertilizer, nor for the speeds at which modern tractors are traveled over the field.

"If we are to get top efficiency and profits from fertilizer use and avoid the hazards of germination injury," Mr. Beers said, "we need widespread use of equipment designed for present day fertilizer.

"Such equipment is available today, but not very many farmers know this. Hence, we need to convince the farmer who buys machinery that accurate placement is worth money to him; and we need to convince him that he should ask for such placement equipment."

He indicated that the fertilizer industry will cooperate with implement manufacturers and with Midwestern agricultural colleges in an educational program to provide farmers with information on what good placement equipment can mean to them.

To conclude the meeting Chairman Kermit C. Berger, professor of Soils at University of Wisconsin, presented the new table of minimum grade needs set up by state agronomists for the Corn Belt states, reproduced on page 38.


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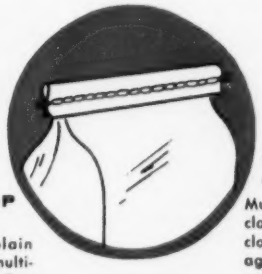

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